CONQUERING WATER FLOWS

The Legacy of Spanish Occupation that Shaped a Thirsty Future for the Endorheic Basin of Mexico

Alejandro Mendiola De la Peña
AR3CS100 Graduation Studio
Cross Domain City of the Future
P5 Presentation

3D reconstruction of Tenochtitlan by Thomas Kole

Location

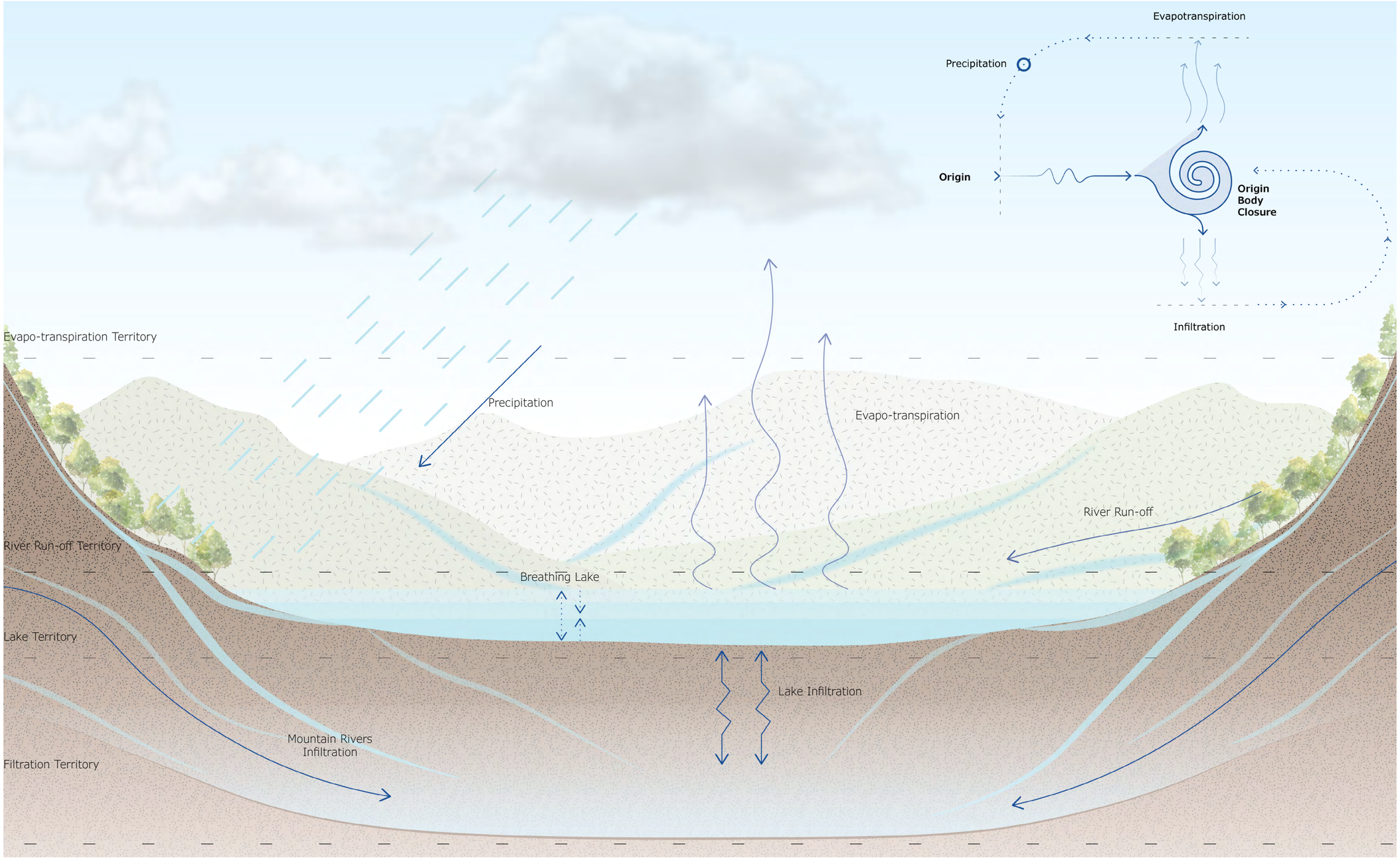
The Basin of Mexico in the XV Century

5 Ancient Lakes
Land and Mountains
Dynamic Border

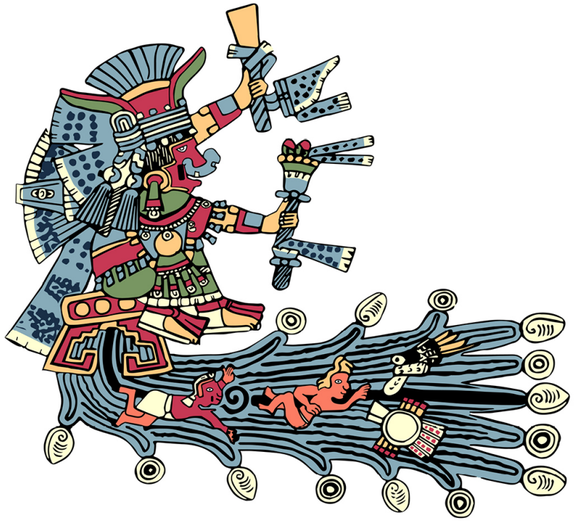
0Km 5Km 10Km 15Km

Basin of Mexico

Elements of the Water Cycle



Aztec Cosmology
"Teotl" as a natural phenomena



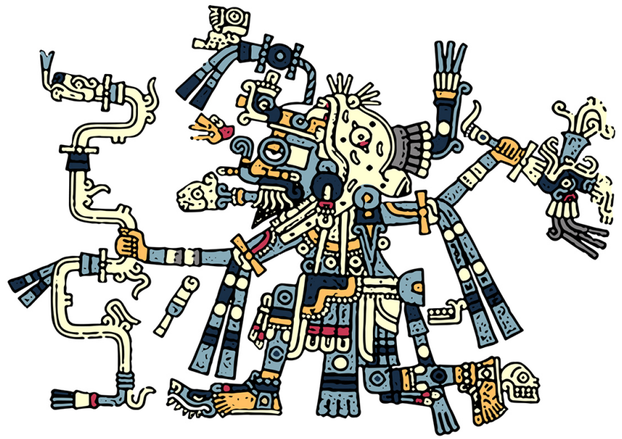
Tlalocantecuhtli or "Tlaloc"

Sky to Land

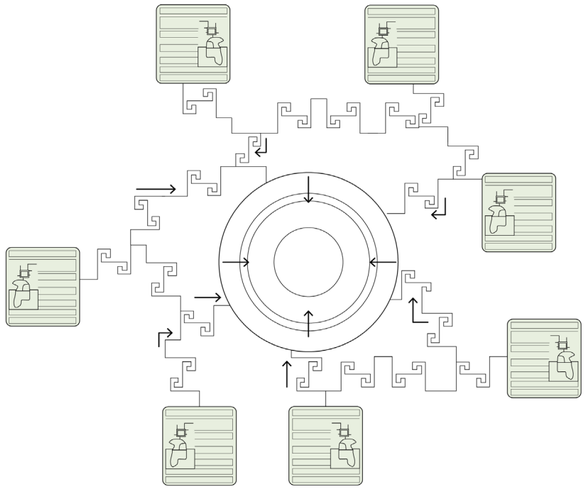
+0.00

Chalchiuhtlicue

Underground to Surface



Chinampa in Xochimilco in 1908
Source: Eugenio Espino Barrios

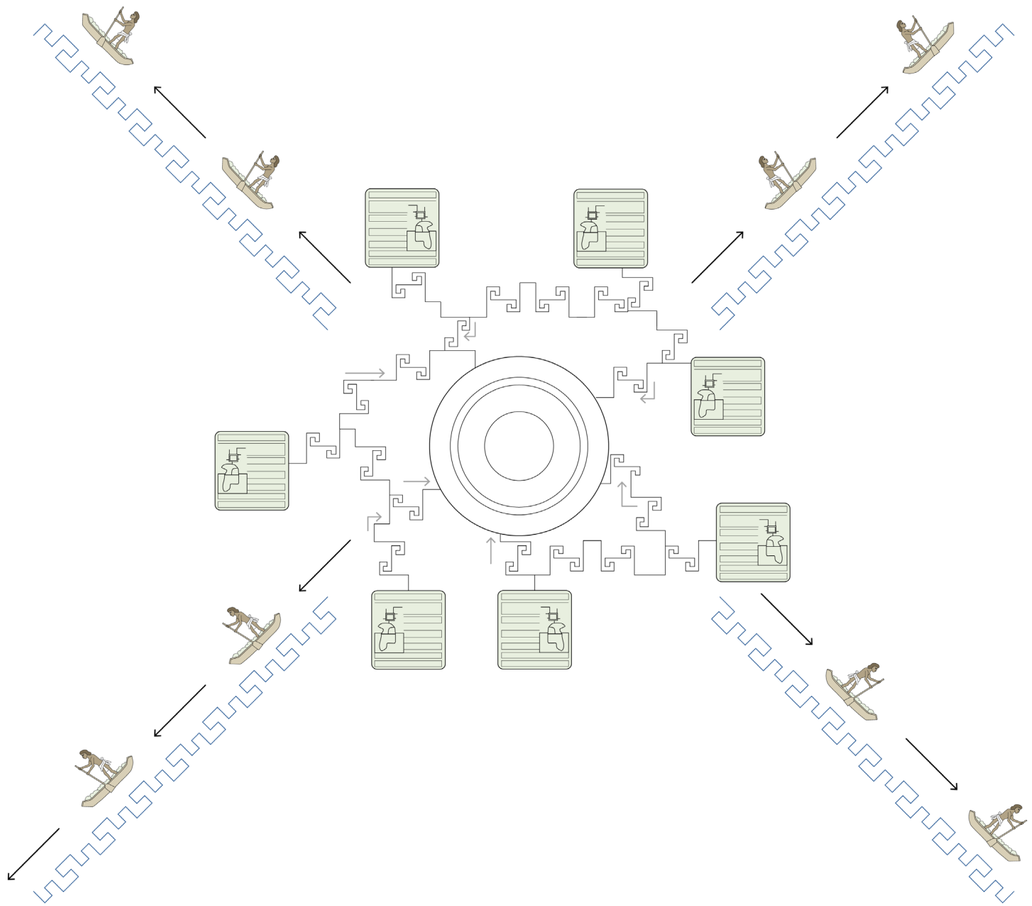


City Centre

Chinampa

Representation of Water Practices in the Pre-Hispanic Era - 1541a.D.
Source: Mendoza Codex, pp. 60 (fragment)

Trajinera
Water Transportation System

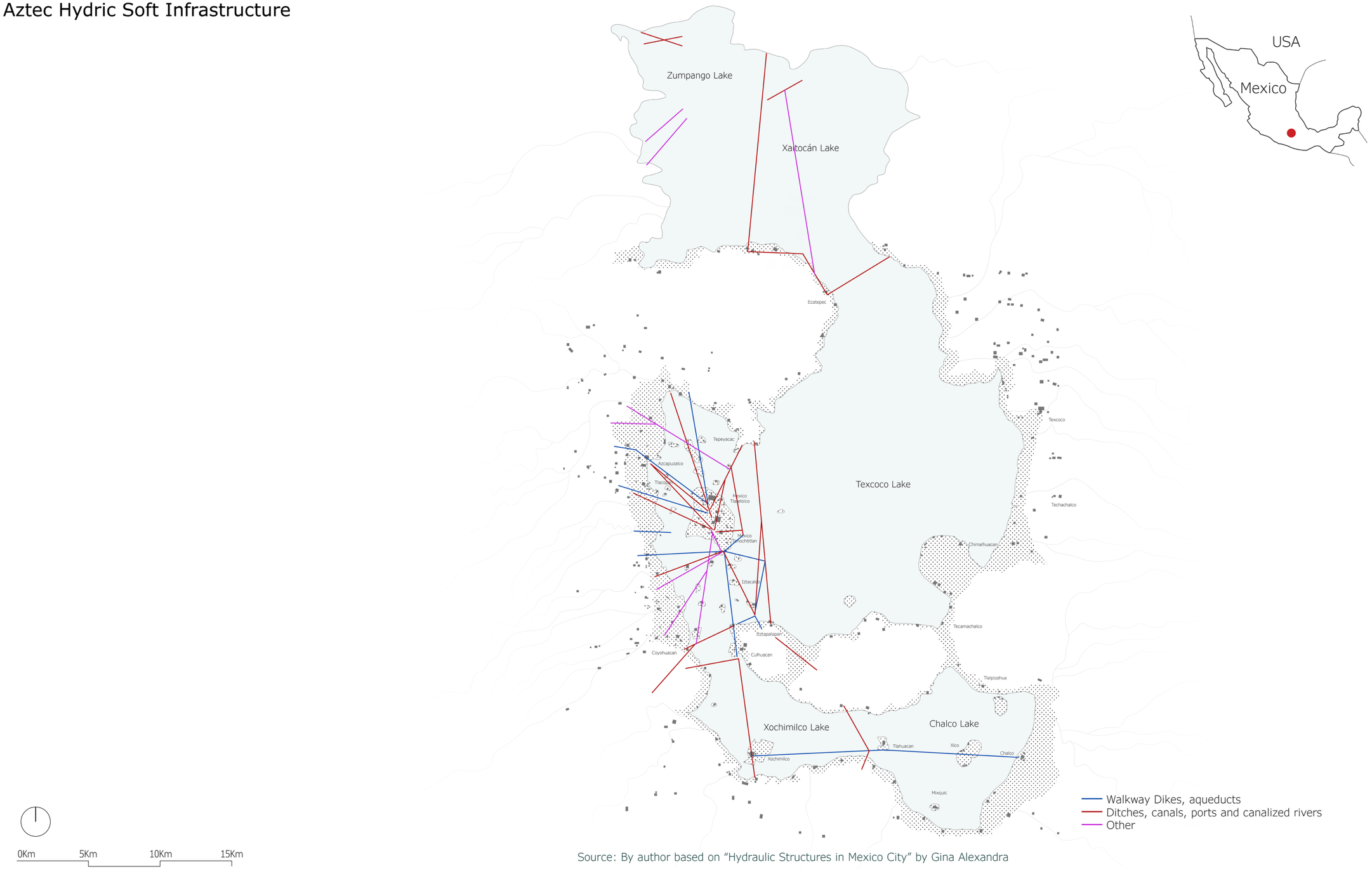


City Centre

Chinampa

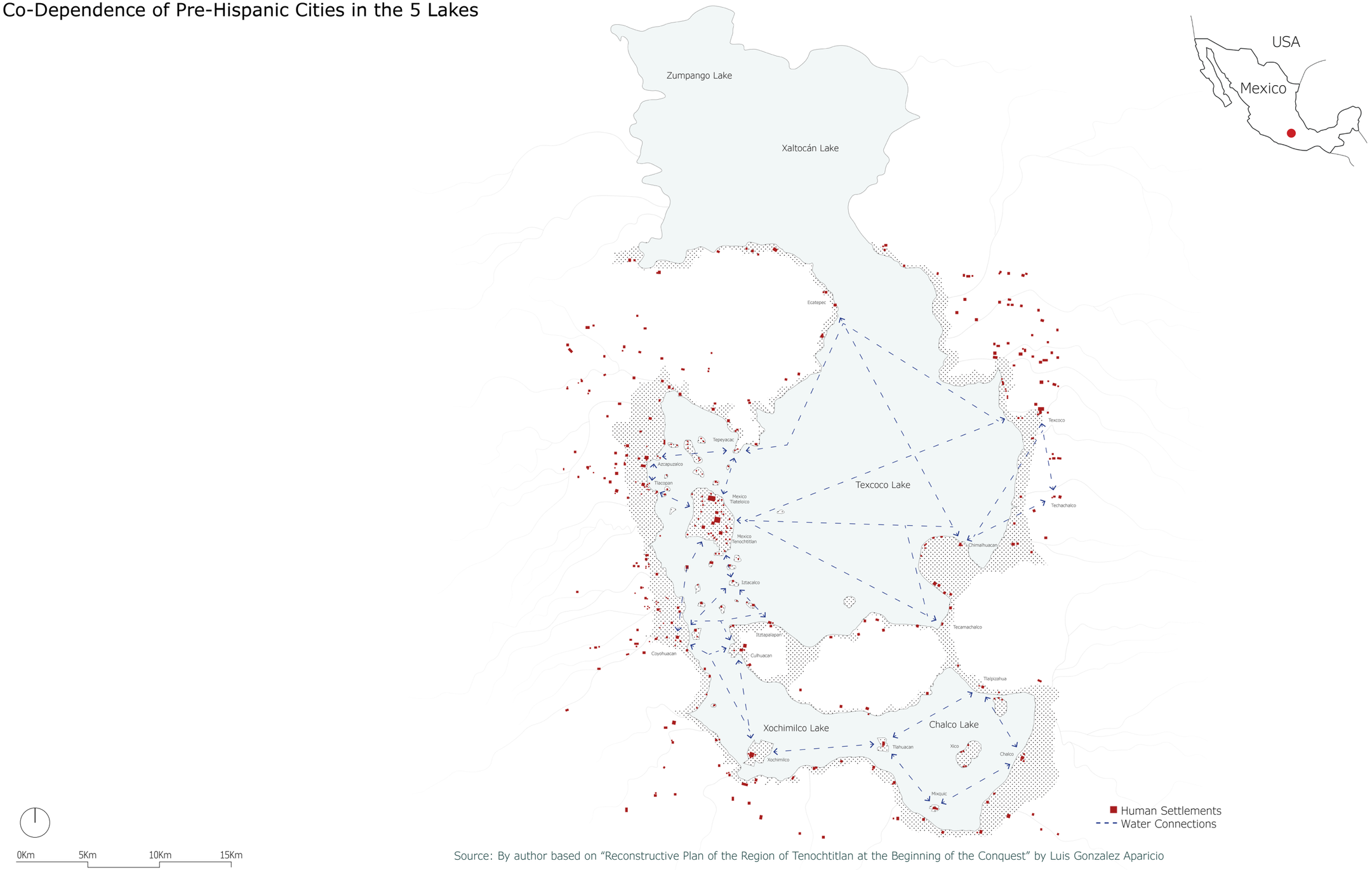
Trajinera

Aztec Hydric Soft Infrastructure



Source: By author based on “Hydraulic Structures in Mexico City” by Gina Alexandra

Co-Dependence of Pre-Hispanic Cities in the 5 Lakes

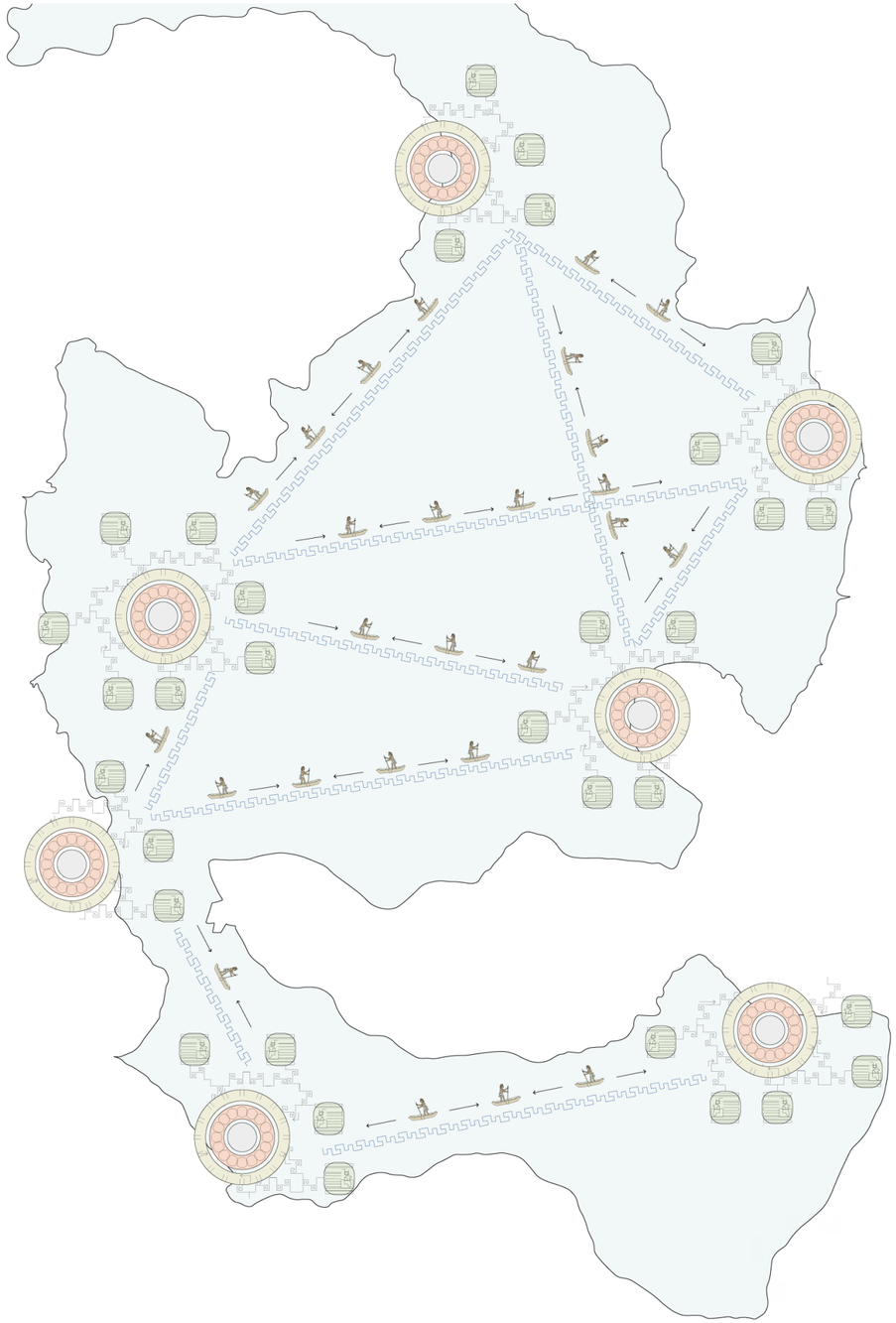


Source: By author based on “Reconstructive Plan of the Region of Tenochtitlan at the Beginning of the Conquest” by Luis Gonzalez Aparicio

Tianguis

Tlatelolco Tianguis Model

Source: Field Museum of Natural History, Chicago, USA - 2010



Chinampa

Trajinera

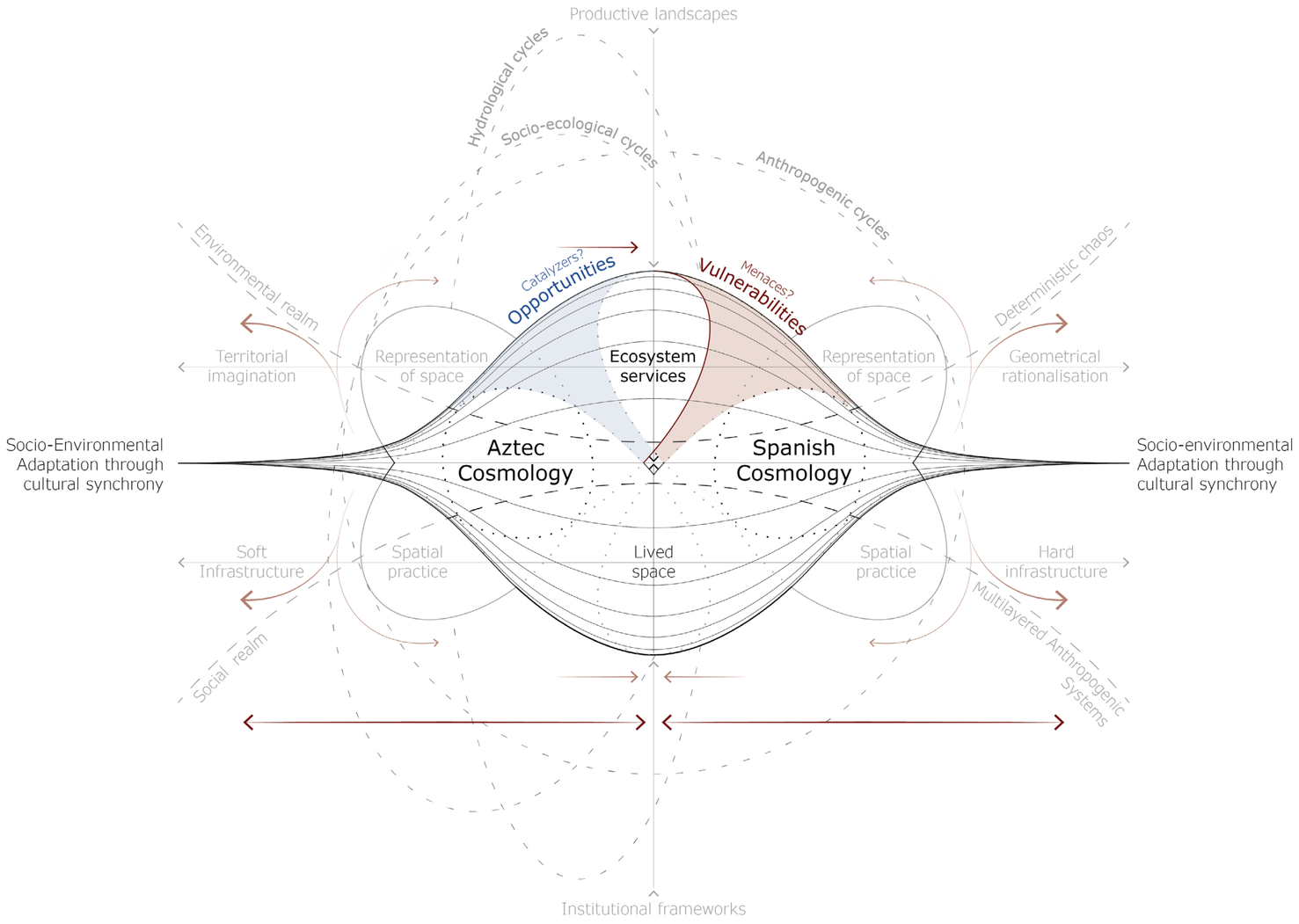
Tianguis


Basin of Mexico - XV Century
3D reconstruction of Tenochtitlan by Thomas Kole • drone photography by Andrés Semo

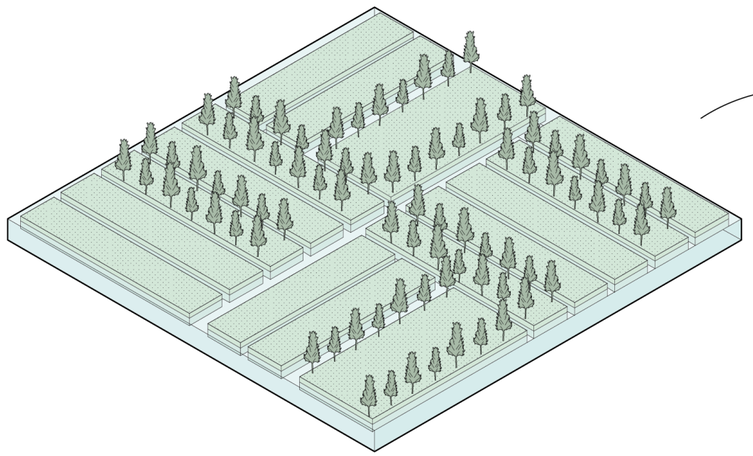

Basin of Mexico - XXI Century
3D reconstruction of Tenochtitlan by Thomas Kole - drone photography by Andres Semo

Clash of Cosmologies

Cosmologies as Producers of Representation of Space, Practices and City

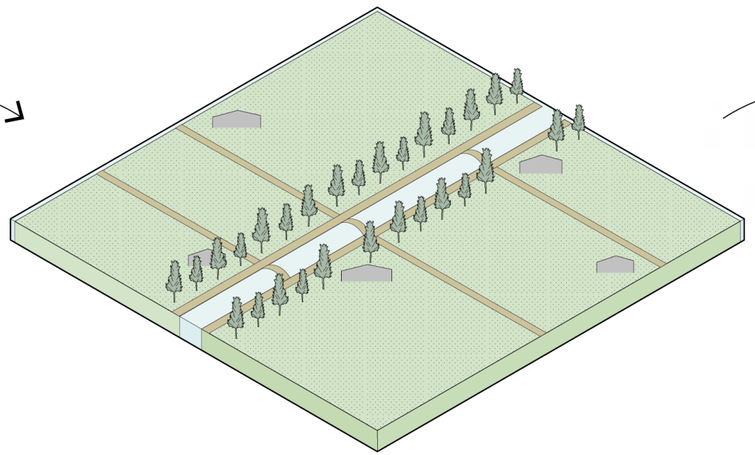


Evolution of Urban Fabric



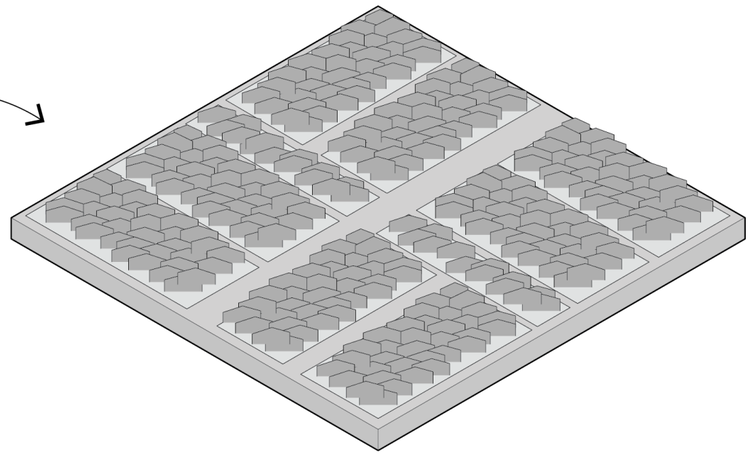
“Chinampa” Plot

Floating City
Water Infrastructure
Dynamic and Soft Borders



“Tabla” Plot

Static City
Rationalized Land
Contained Water Movement



Dry City Plot

Static City
Mineral Land
Banished Water

Roldán Street, Mexico City 1870

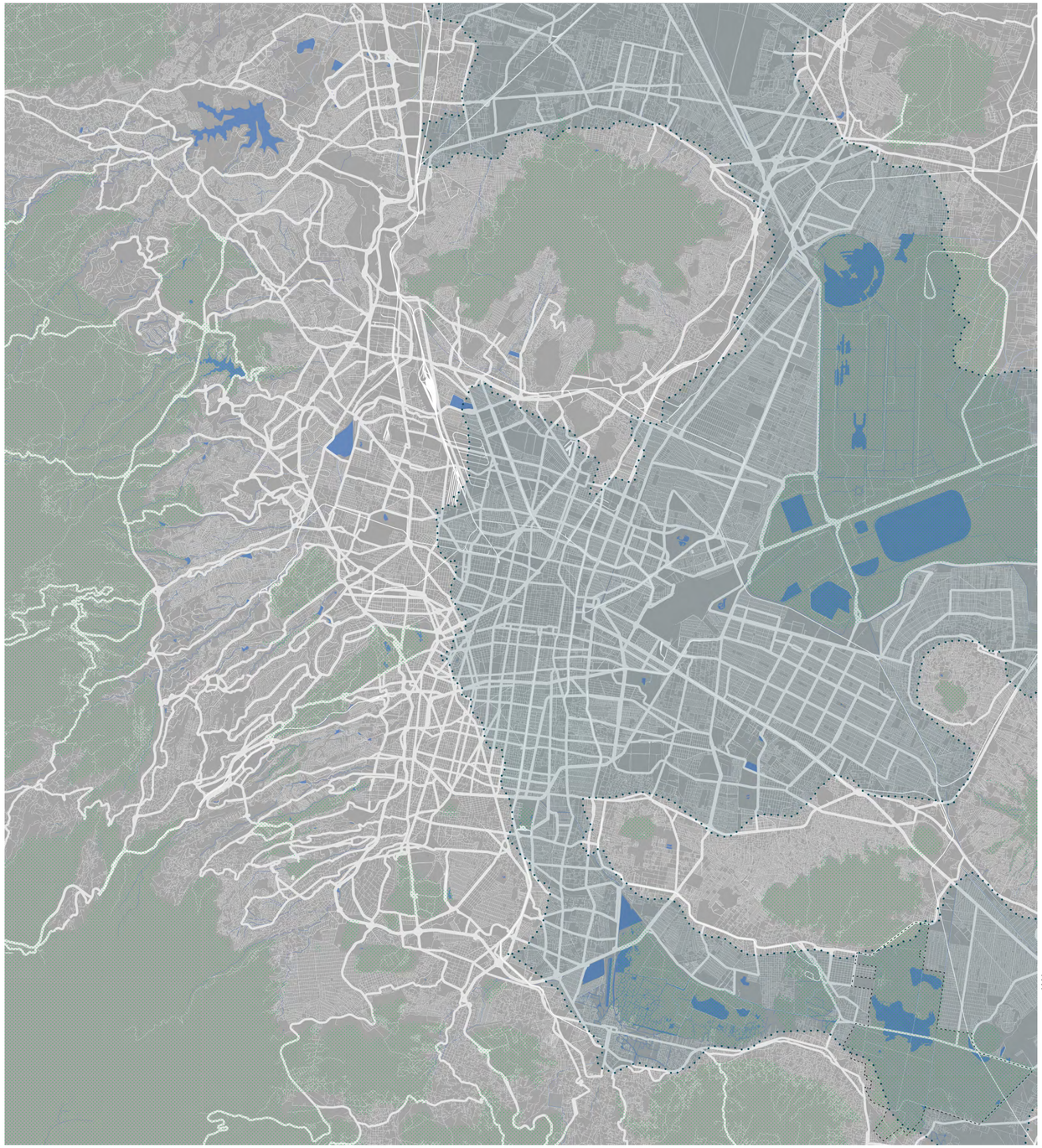
Roldán Street, Mexico City 2025

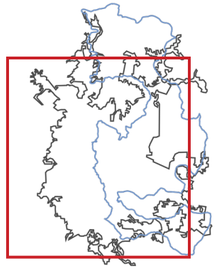
Viga Canal, Mexico City 1905

Source: Archivo General de la Nación, Mexico

Viga Canal, Mexico City 2025

Urban Sprawl and Remaining Water Bodies



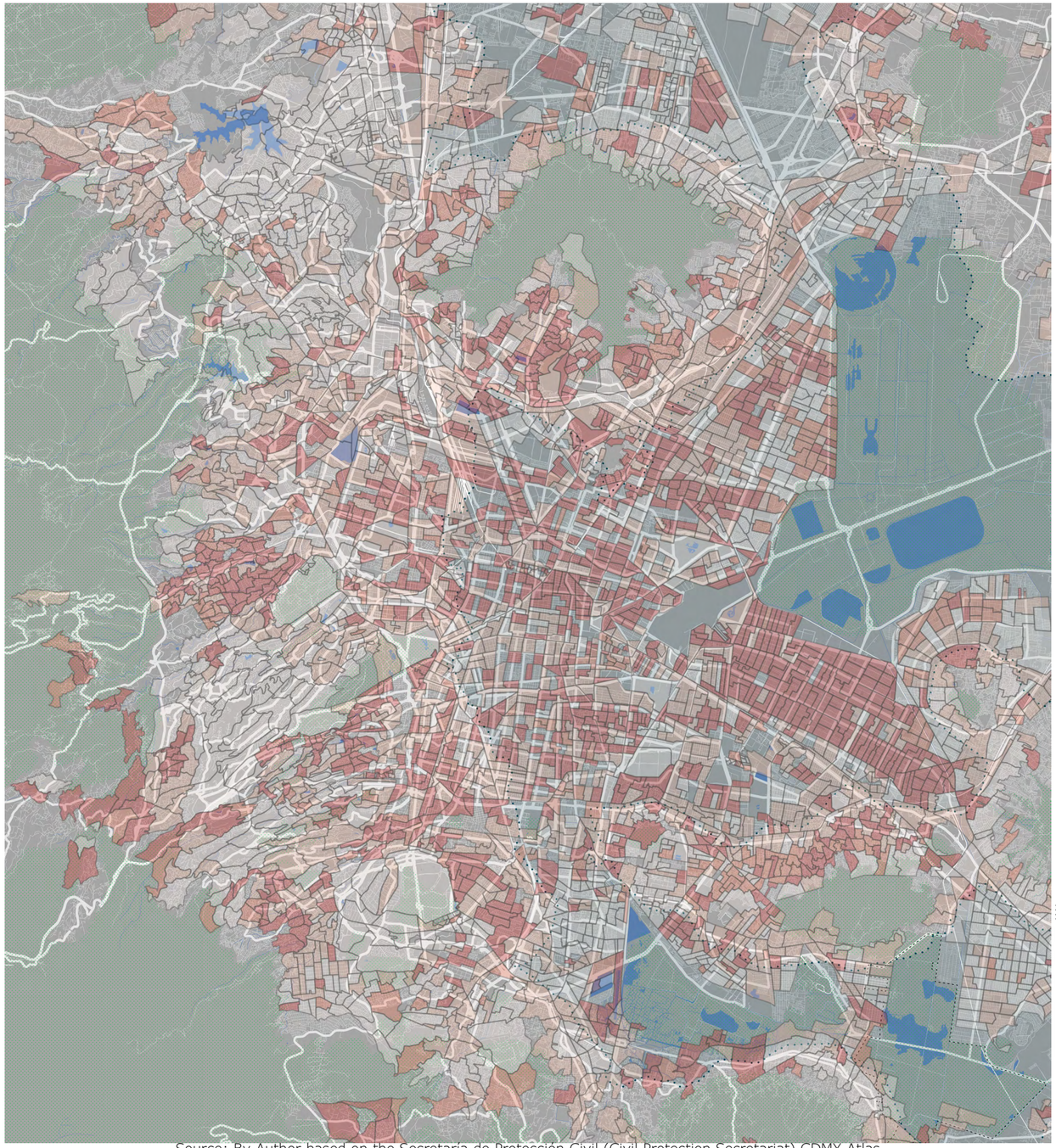


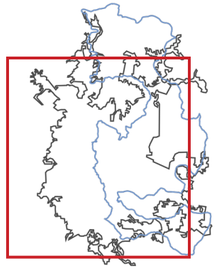
Annual Precipitation	
Delft	840-880mm
Mexico City	700-820mm
London	550-720mm

Projection Ancient Lakes
Remaining Water Bodies
City Sprawl
Green Areas

0Km 2.5Km 5Km 7.5Km

Areas Vulnerable to Flooding



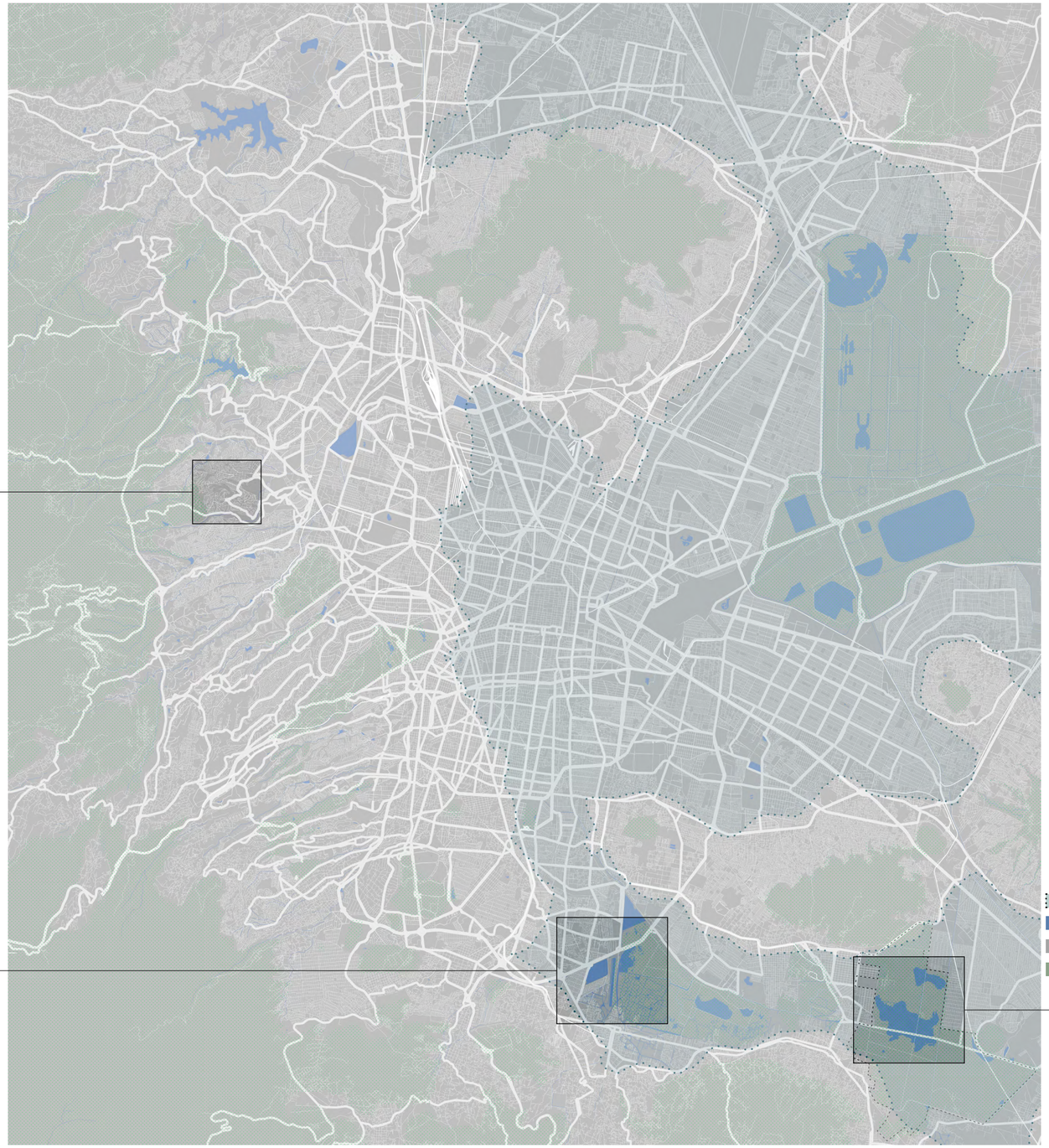


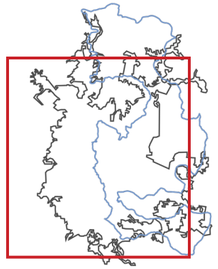
Projection Ancient Lakes
Remaining Water Bodies
City Sprawl
Green Areas
+
Areas Vulnerable to Flooding
-

0Km 2.5Km 5Km 7.5Km

Source: By Author based on the Secretaría de Protección Civil (Civil Protection Secretariat) CDMX Atlas

Projects in TU Delft





"Parched Paradise. A Deconstruction of the Mexican Water Crisis"
Author: David J. Sauer
BK - Architecture Track
Year: 2024

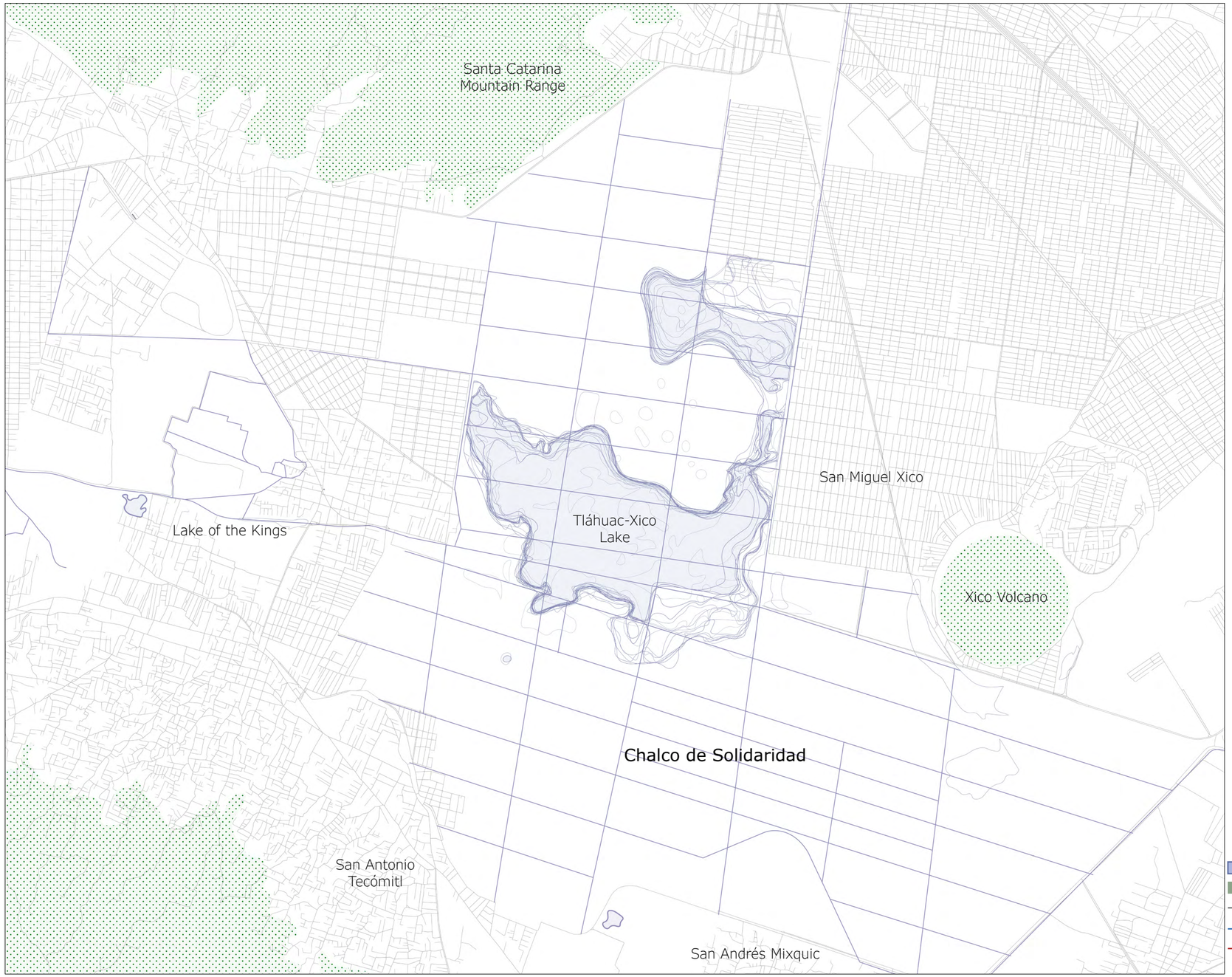
"Memories of Tlaloc: Water as the Cultural Legacy in Xochimilco"
Author: Carolina Márquez
BK - Landscape Track
Year: 2025

Projection Ancient Lakes
Remaining Water Bodies
City Sprawl
Green Areas

Proposed Site

0Km 2.5Km 5Km 7.5Km

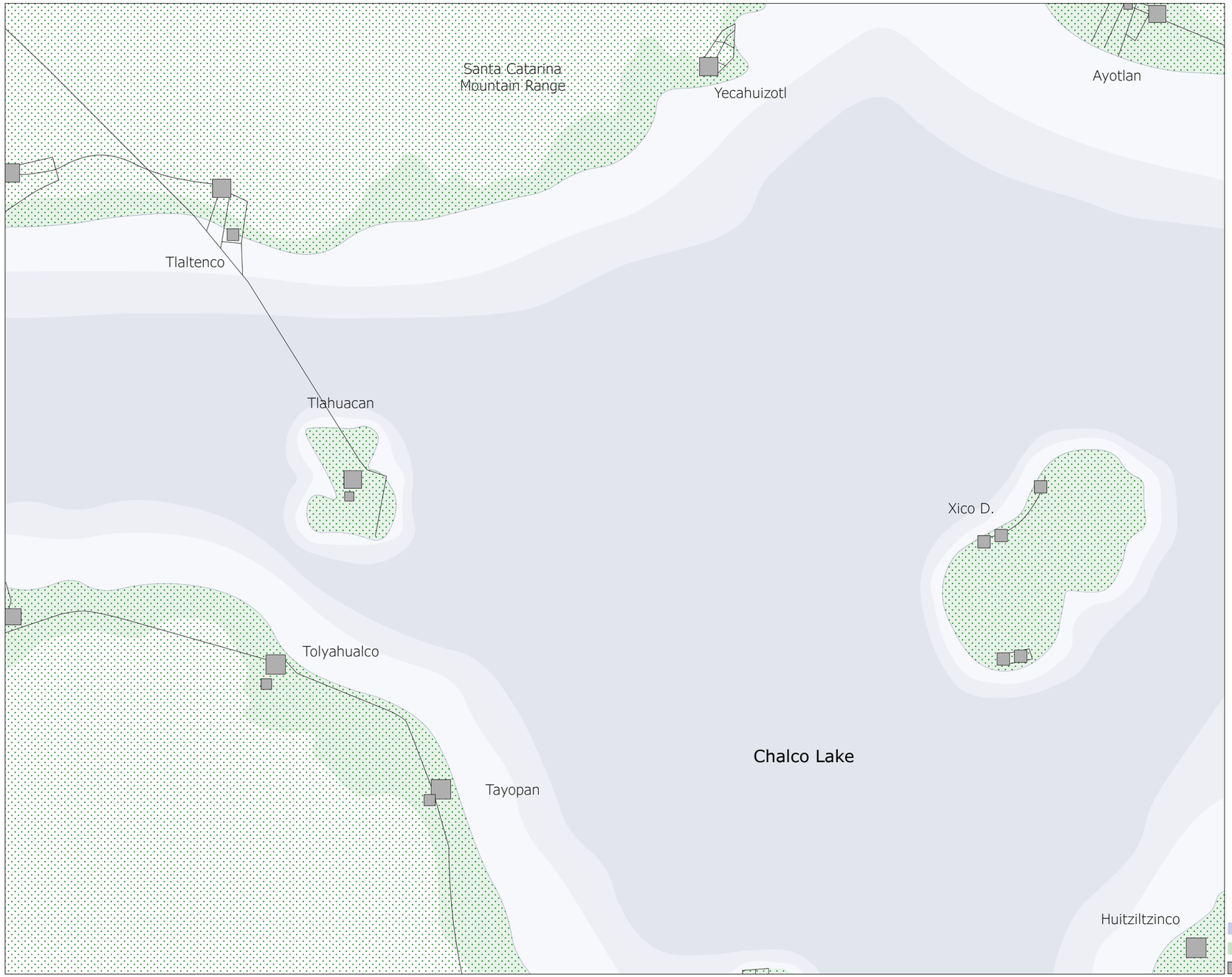
Chalco and the Tláhuac-Xico Lake

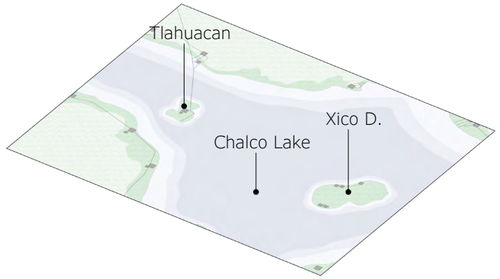


Tláhuac-Xico Lake
Green Areas
City Streets
Canals
Lake Connection Streets

0Km 0.5Km 1Km 1.5Km

Chalco and the Tláhuac-Xico Lake - Chalco Lake

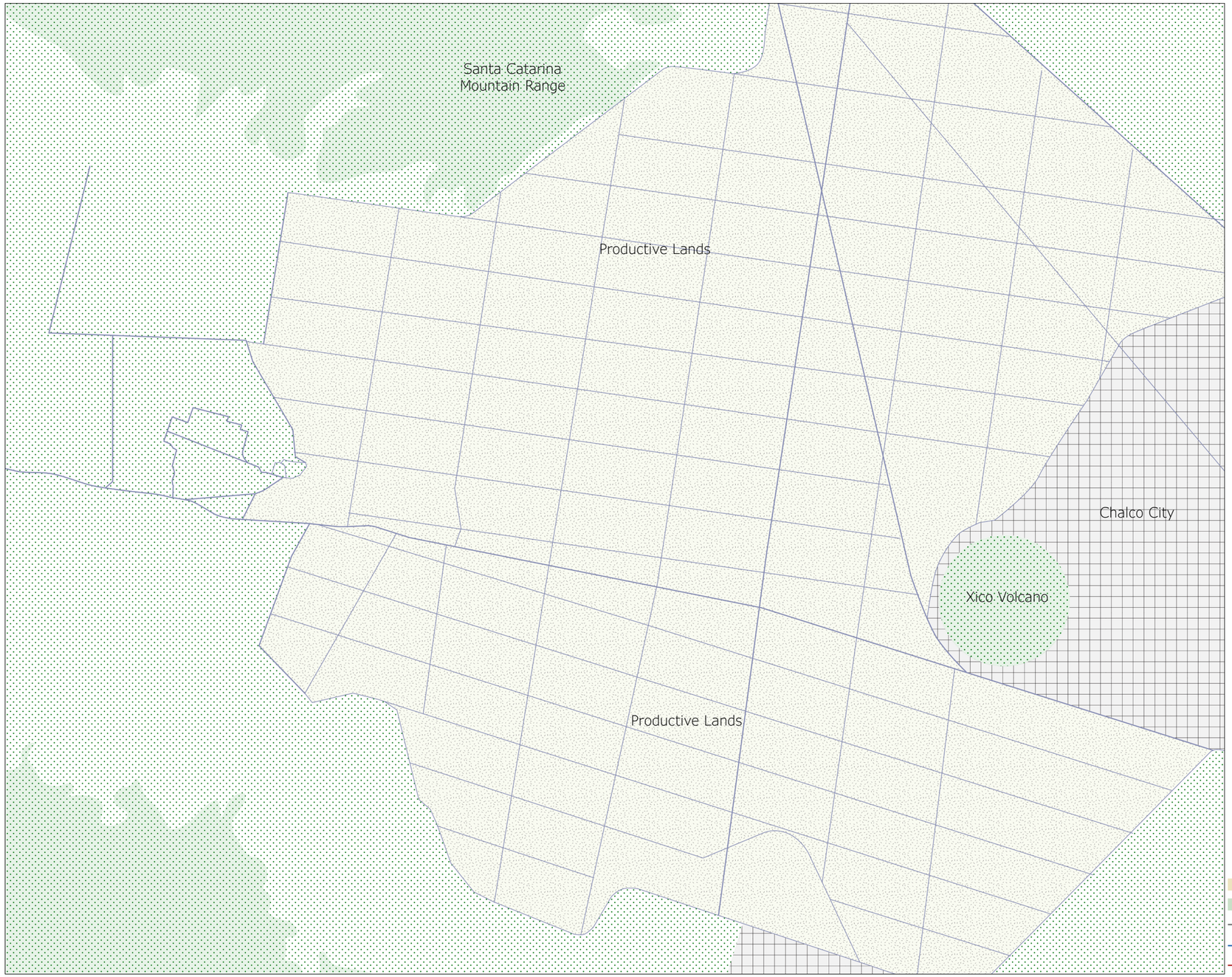


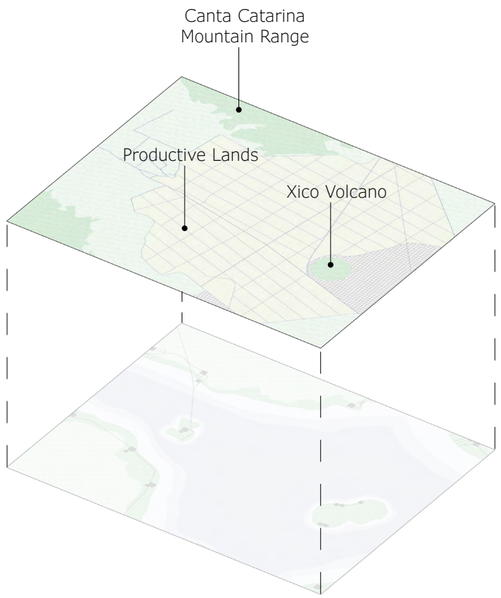


Chalco Lake
Green Areas
Cities

0Km 0.5Km 1Km 1.5Km

Chalco and the Tláhuac-Xico Lake - From Lake to Productive Land

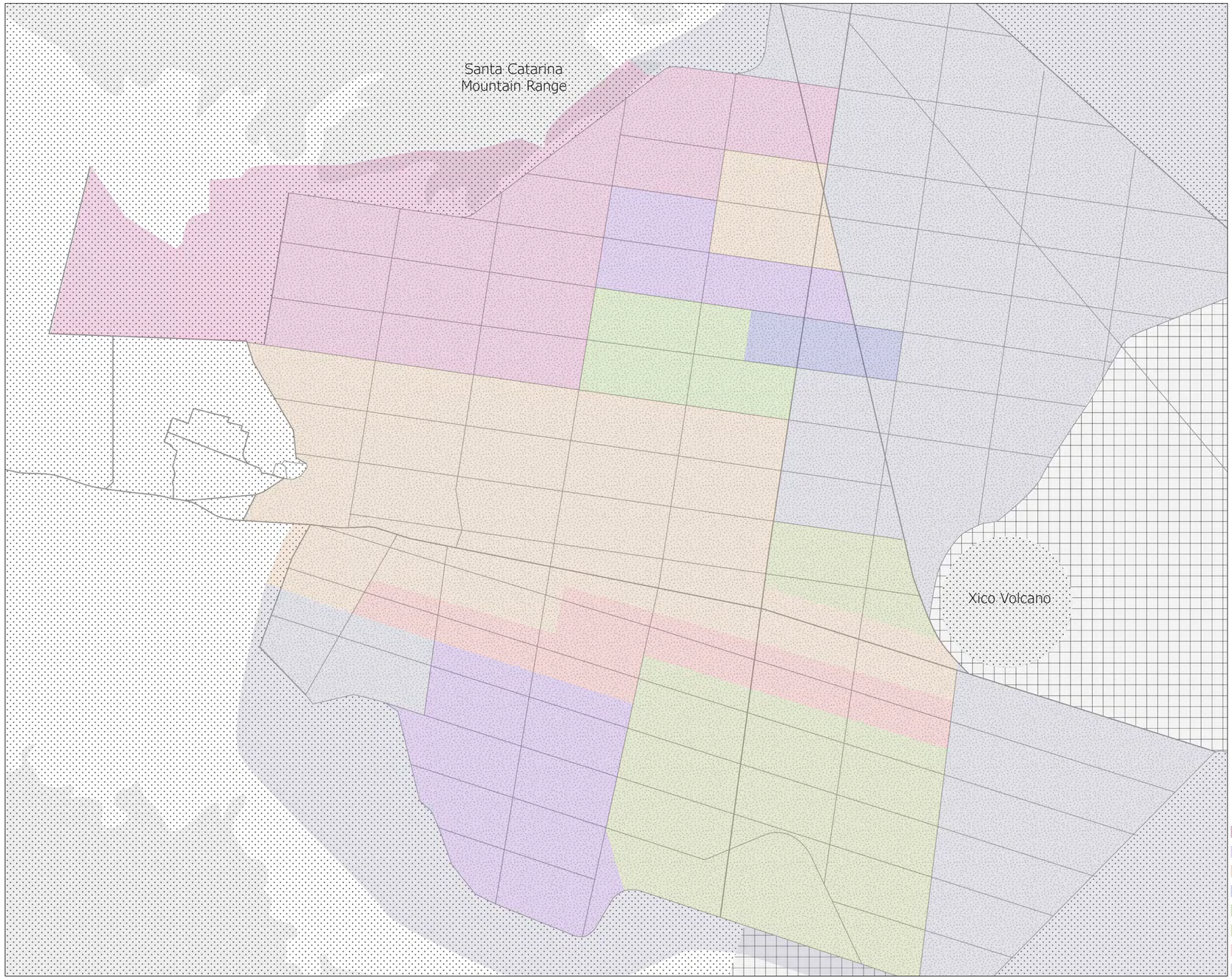


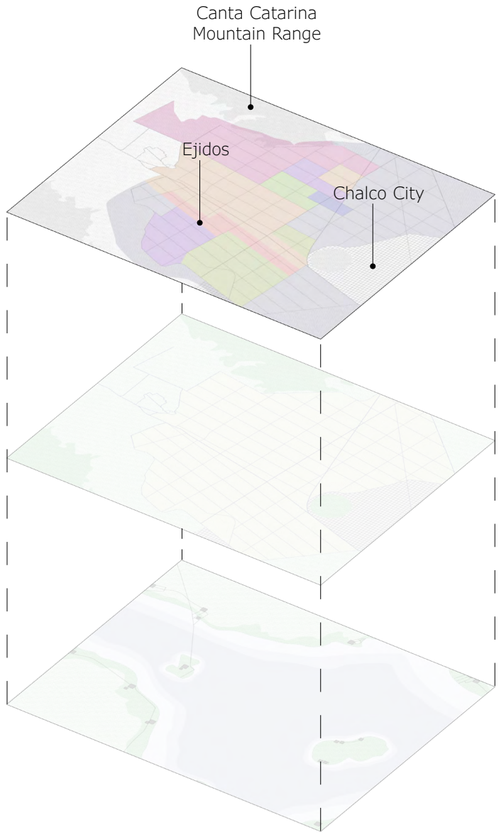


Agriculture Plots
Green Areas
City Streets
Canals
Lake Connection Streets

0Km 0.5Km 1Km 1.5Km

Chalco and the Tláhuac-Xico Lake - Ejidos Land Distribution

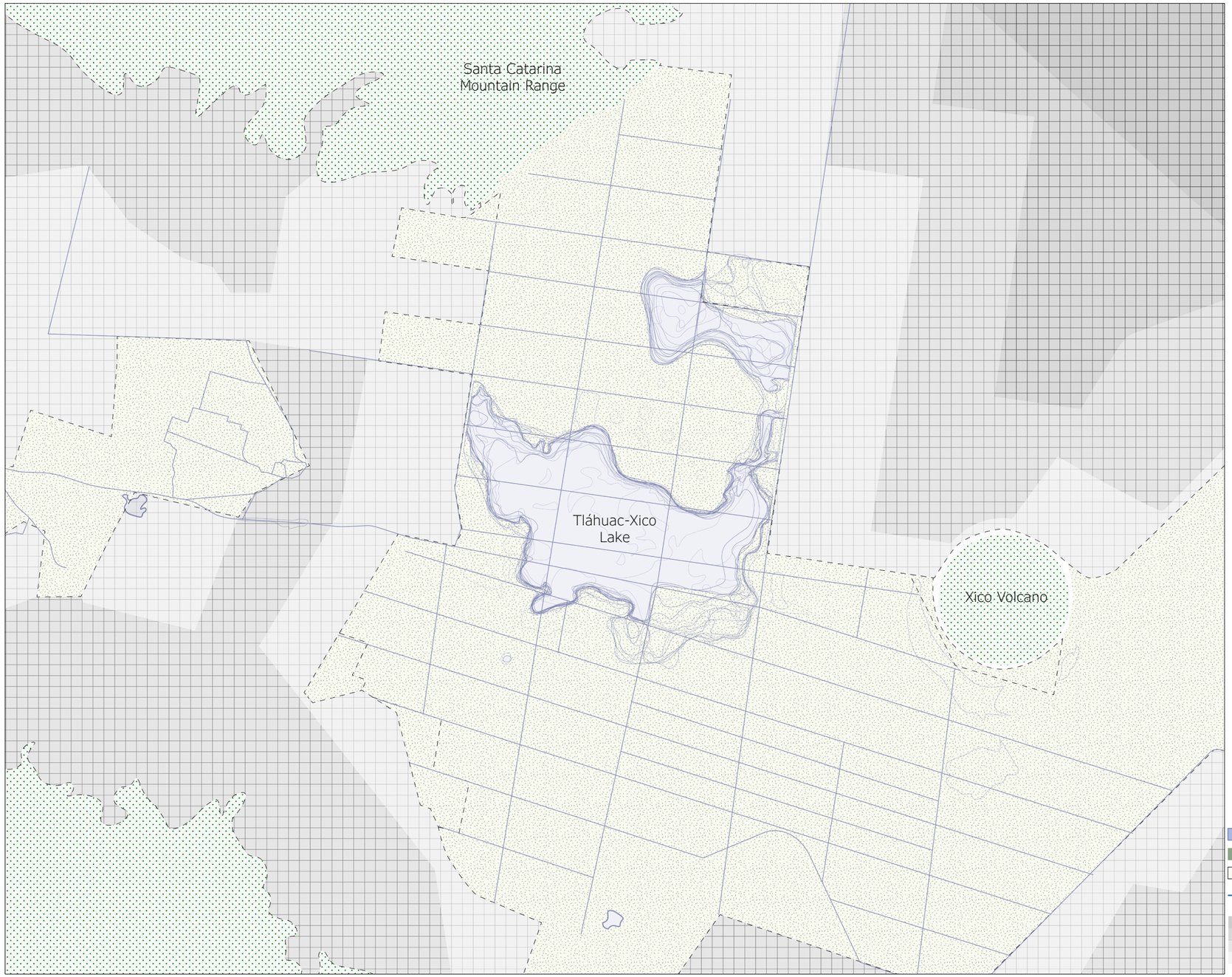


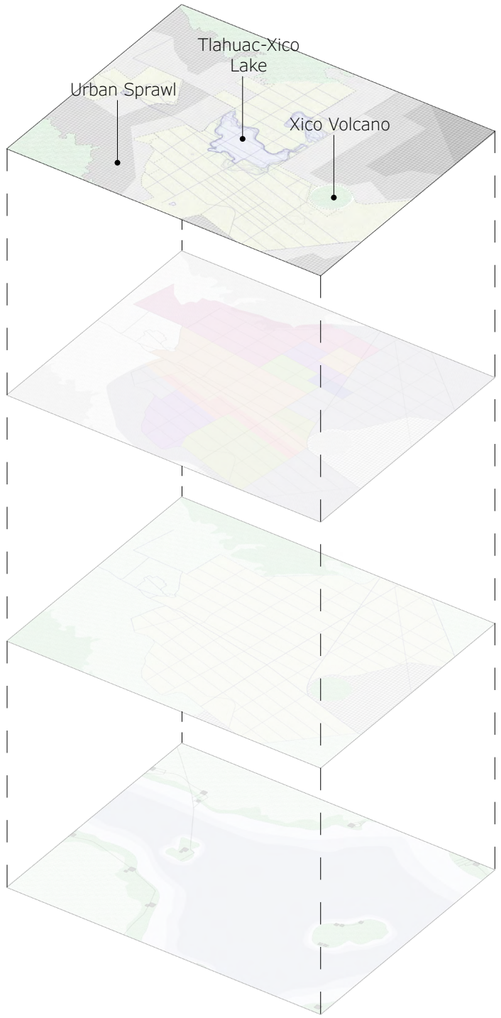


- San Francisco Tlaltenco
- San Juan Ixtayopan
- San Pedro Tláhuac
- San Nicolás Tetelco
- San Antonio Tecómitl
- San Andrés Mixquic
- Santiago Tulyehualco
- Other Ejidos

0Km 0.5Km 1Km 1.5Km

Chalco and the Tláhuac-Xico Lake - Solidaridad Housing Programme

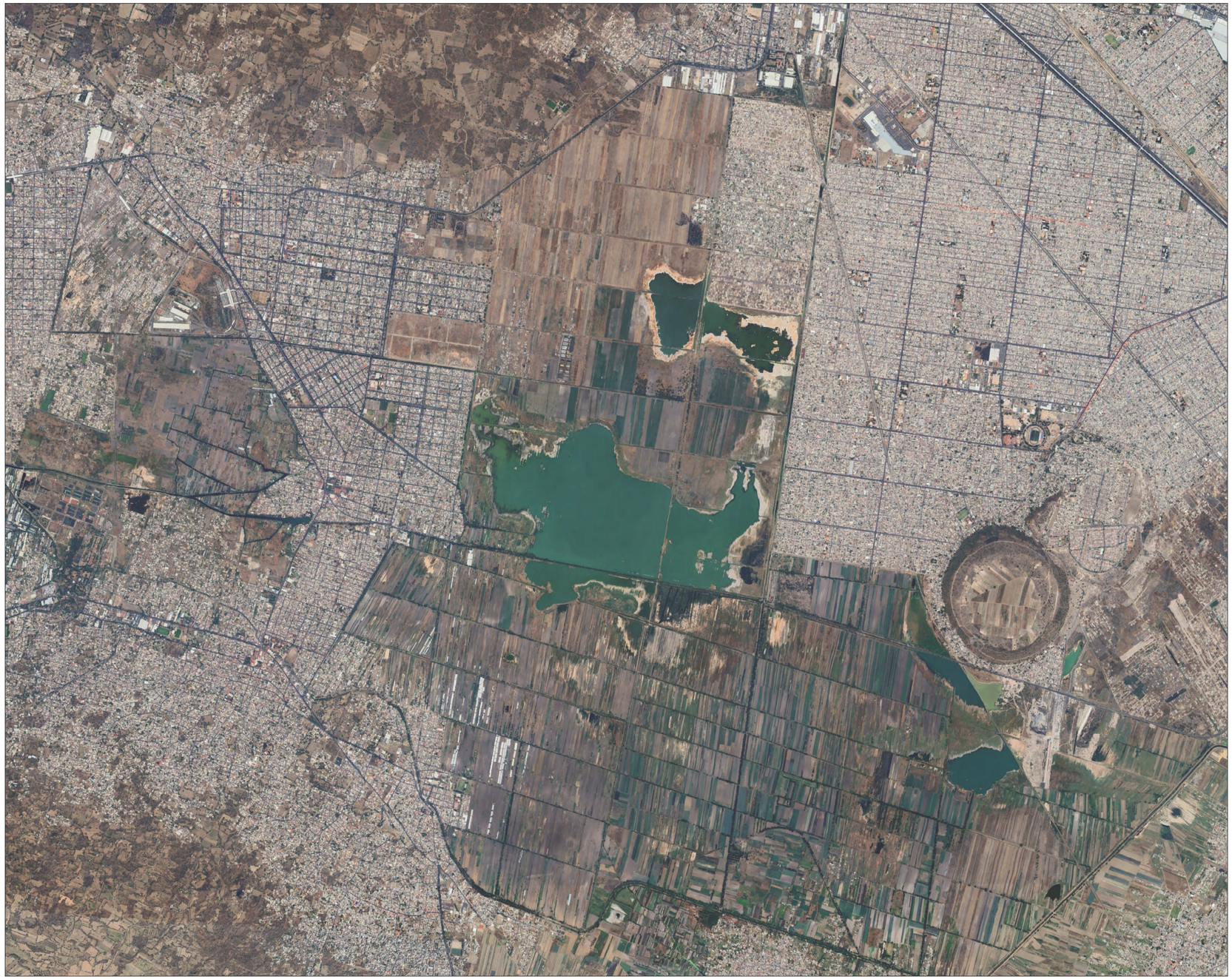


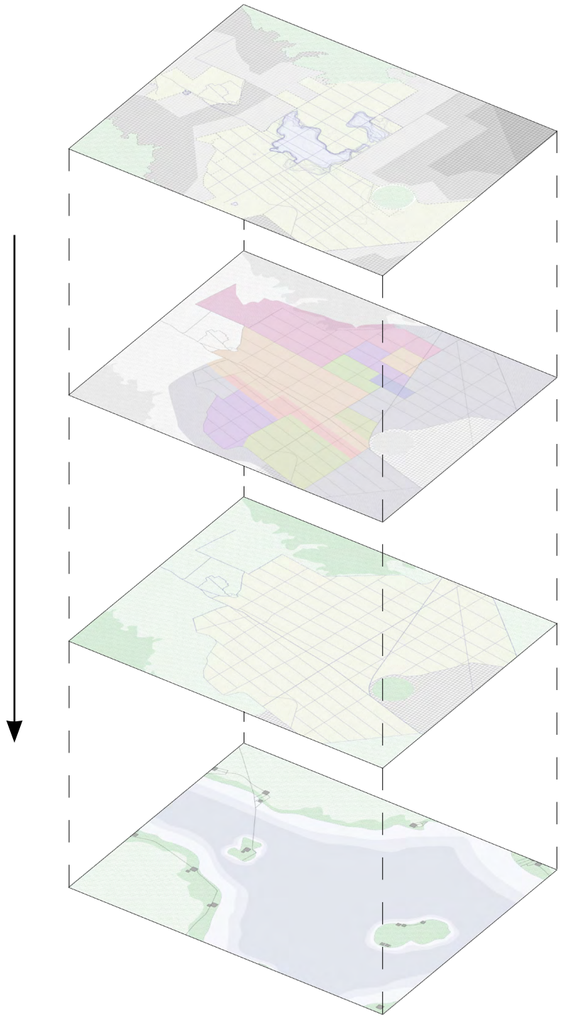


Tláhuac-Xico Lake
Green Areas
Productive Areas
Canals
+
Urbanisation Process
-

0Km 0.5Km 1Km 1.5Km

Chalco and the Tláhuac-Xico Lake - Palimpsest

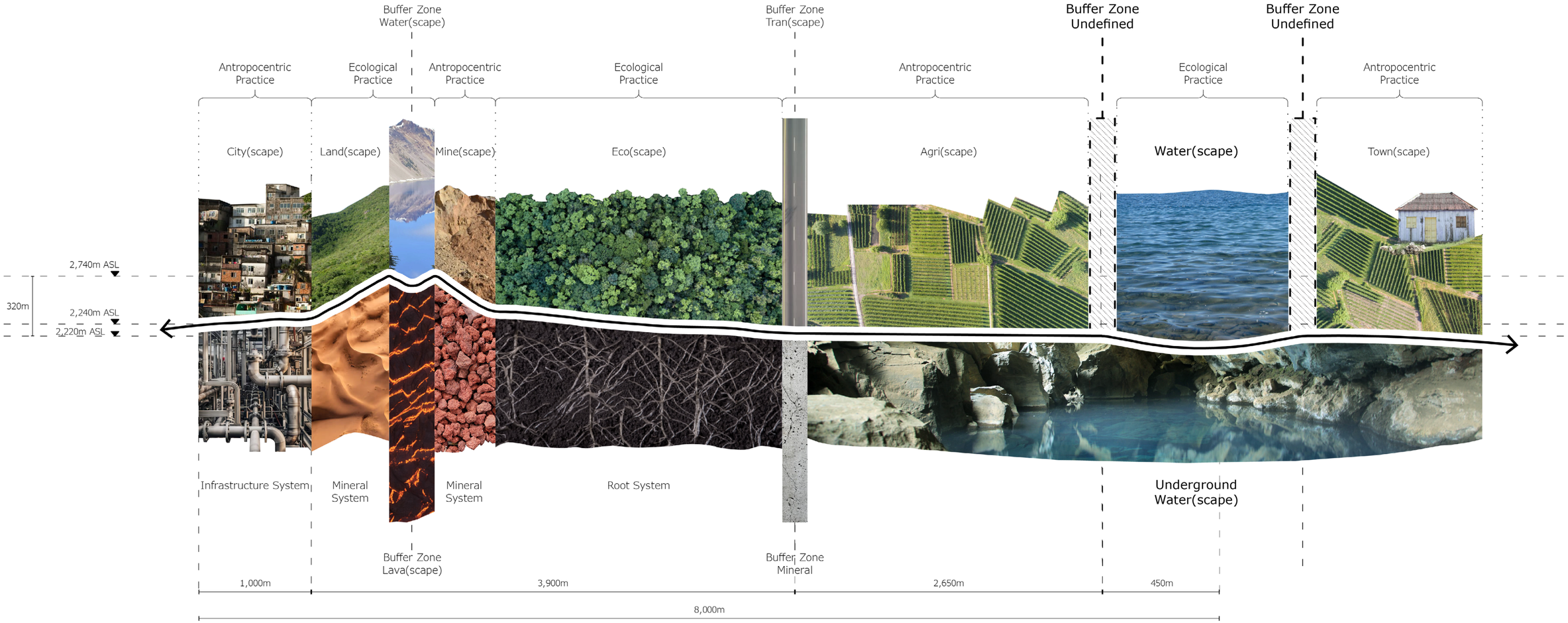




0Km 0.5Km 1Km 1.5Km

Chalco Textures

Layers of the Hydric Cycle

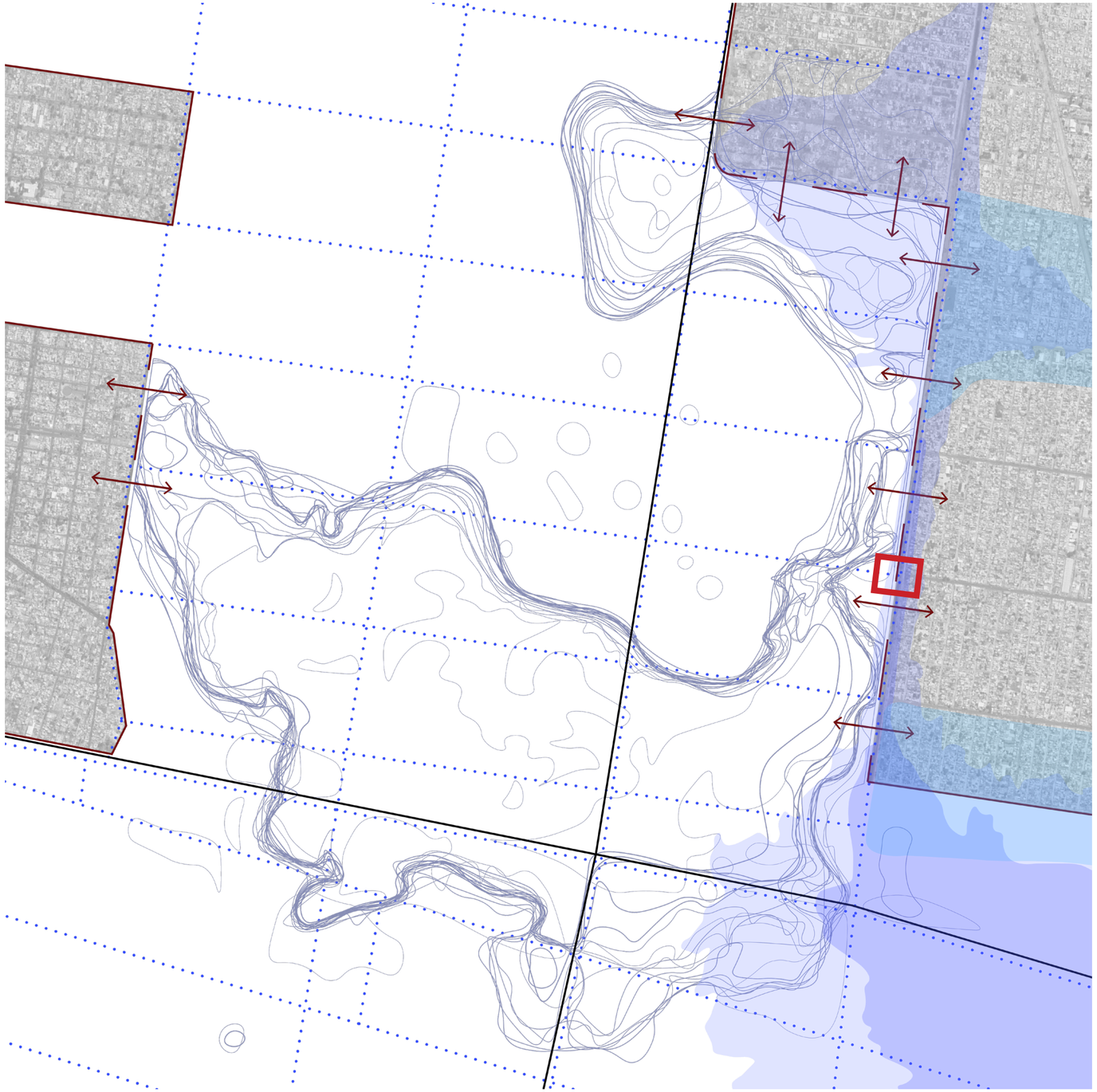


Flood in Chalco - 2024

Source: Green Peace

Hard and Soft Borders

Overflow Zones

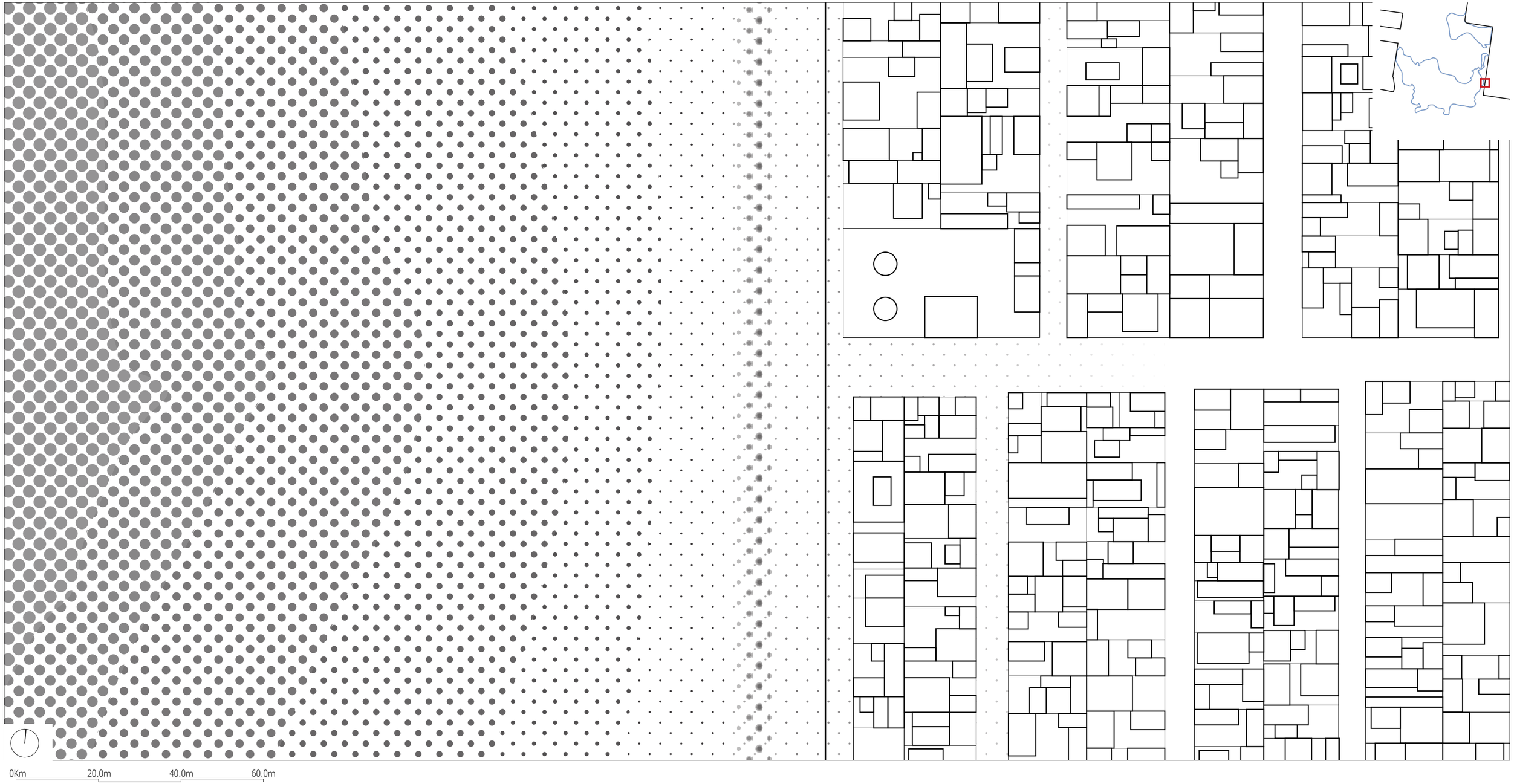


Tláhuac-Xico Lake
City Sprawl
City Hard Border
Canals
Main Connection Streets

0Km 0.5Km 1Km 1.5Km

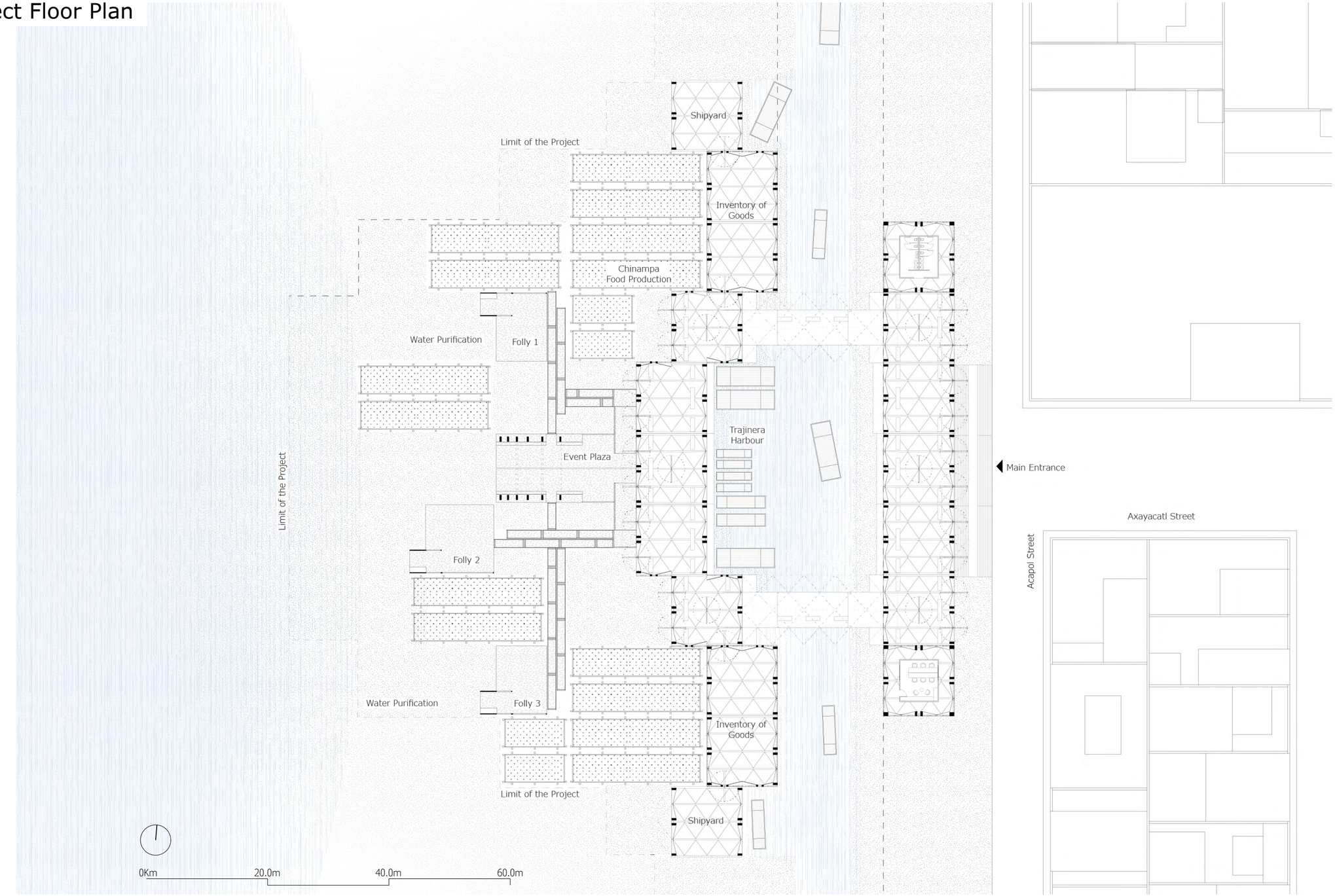
Selected Site - A Divided Society

Selected Site - A Dialogue with the City

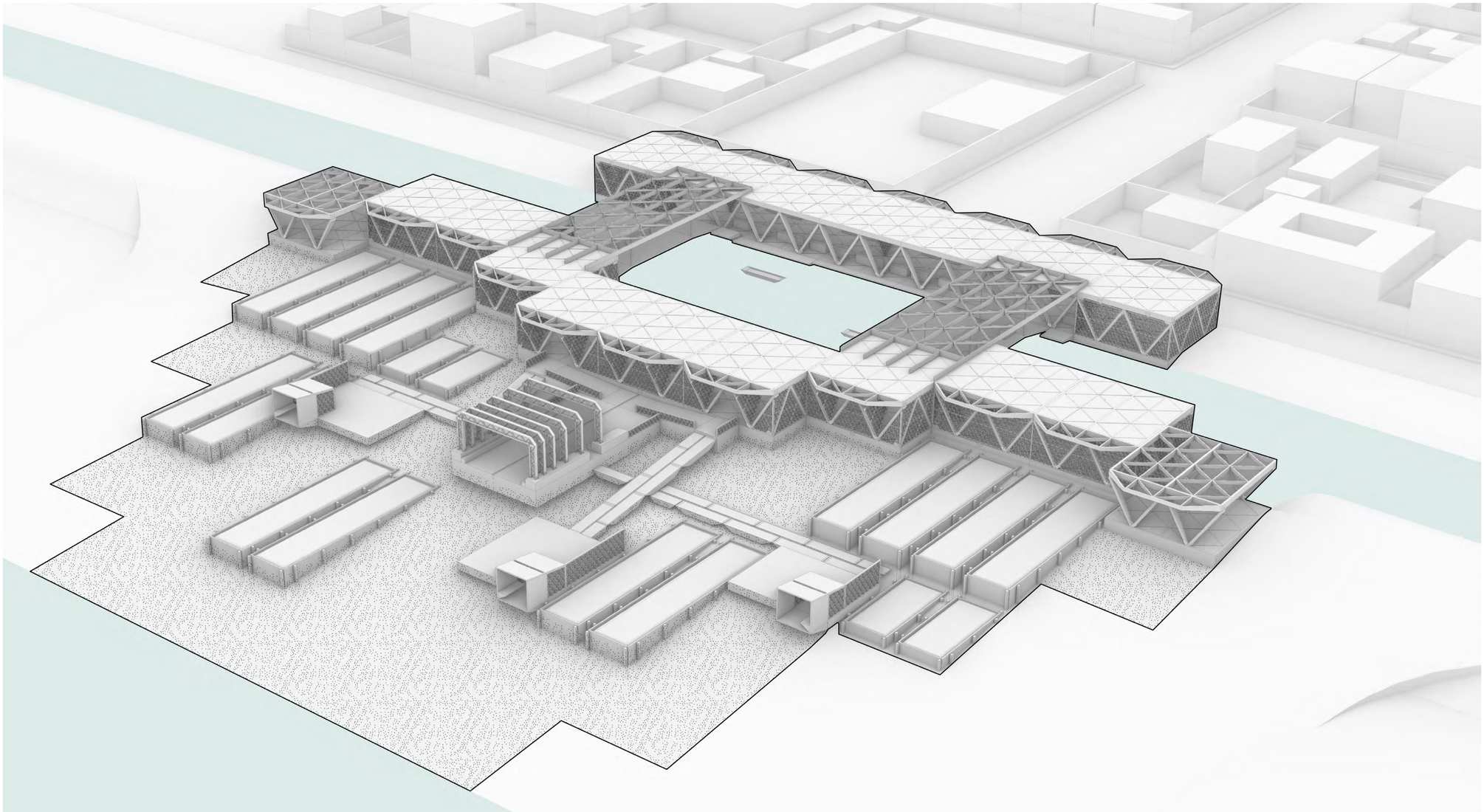


Break the Dyke

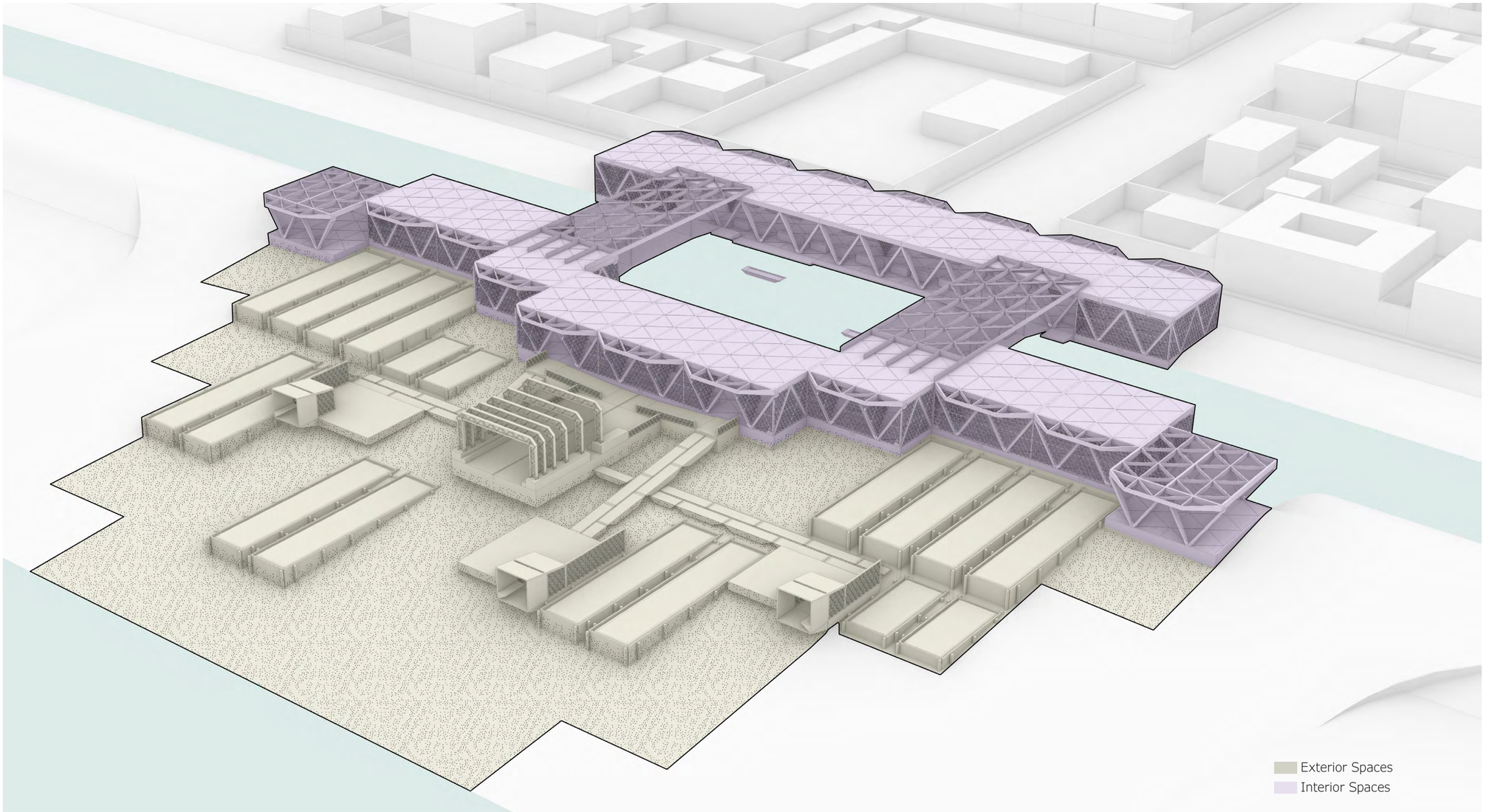
Project Floor Plan



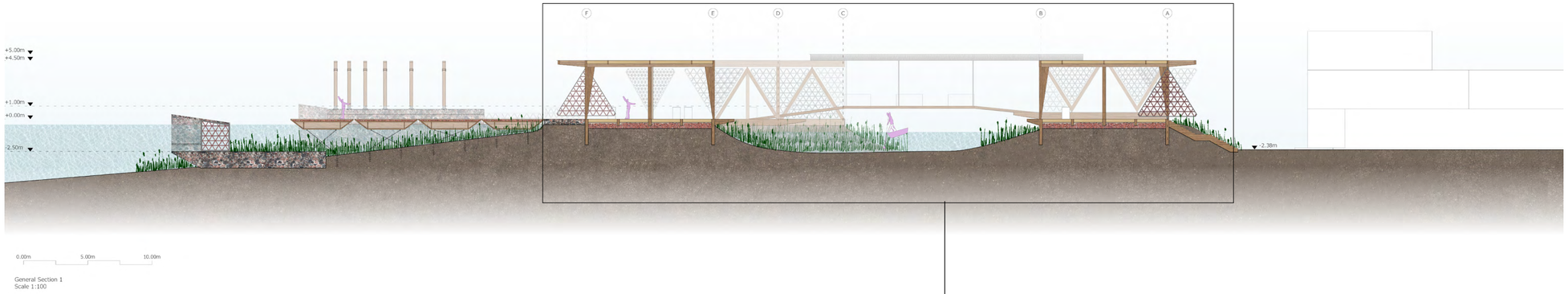
Project General Axonometry

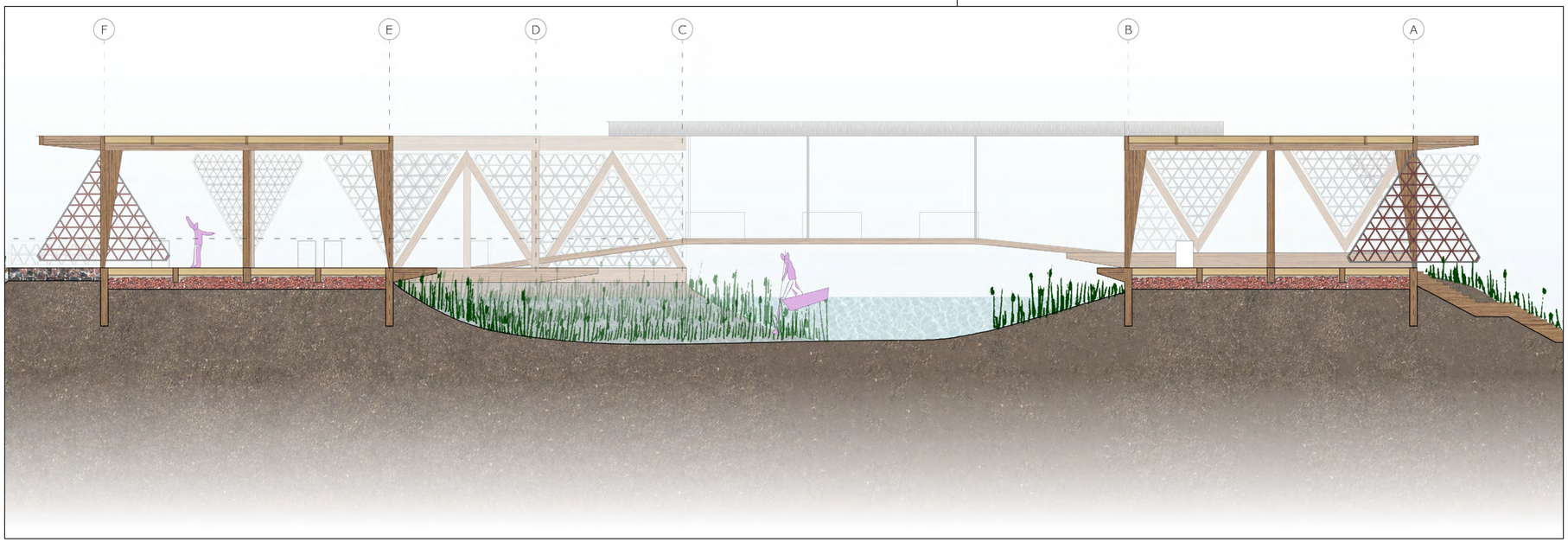


Project General Axonometry - Divisions

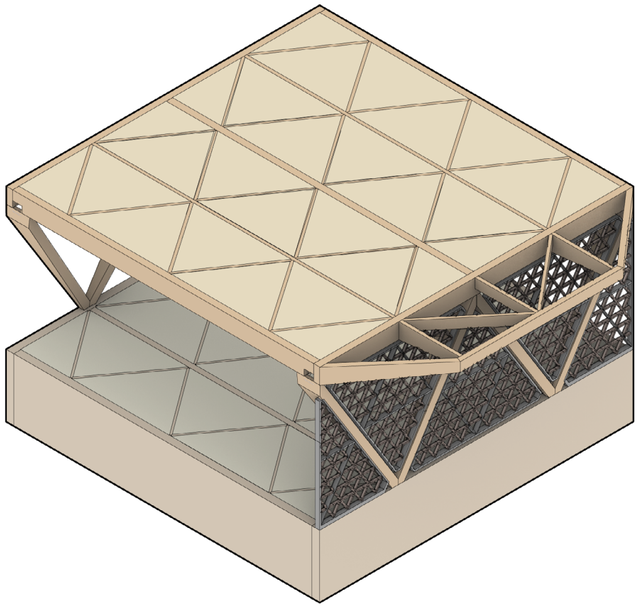


General Section 1





Tianguis Module



Tianguis Module

Reed Web Roofing

Timber Beam Mexican Pine (Pinus spp)
Main Structure
50.0cm X 20.0cm

Timber Beam Mexican Pine (Pinus spp)
Secondary Structure
30.0cm X 10.0cm

Timber Tilted Column Mexican Pine (Pinus spp)
Main Structure
min. 16.0cm X 28.8cm - max. 73.3cm X 28.8cm

Adobe Lattice Skin with Metal Frame Structure
Structure width: 15cm

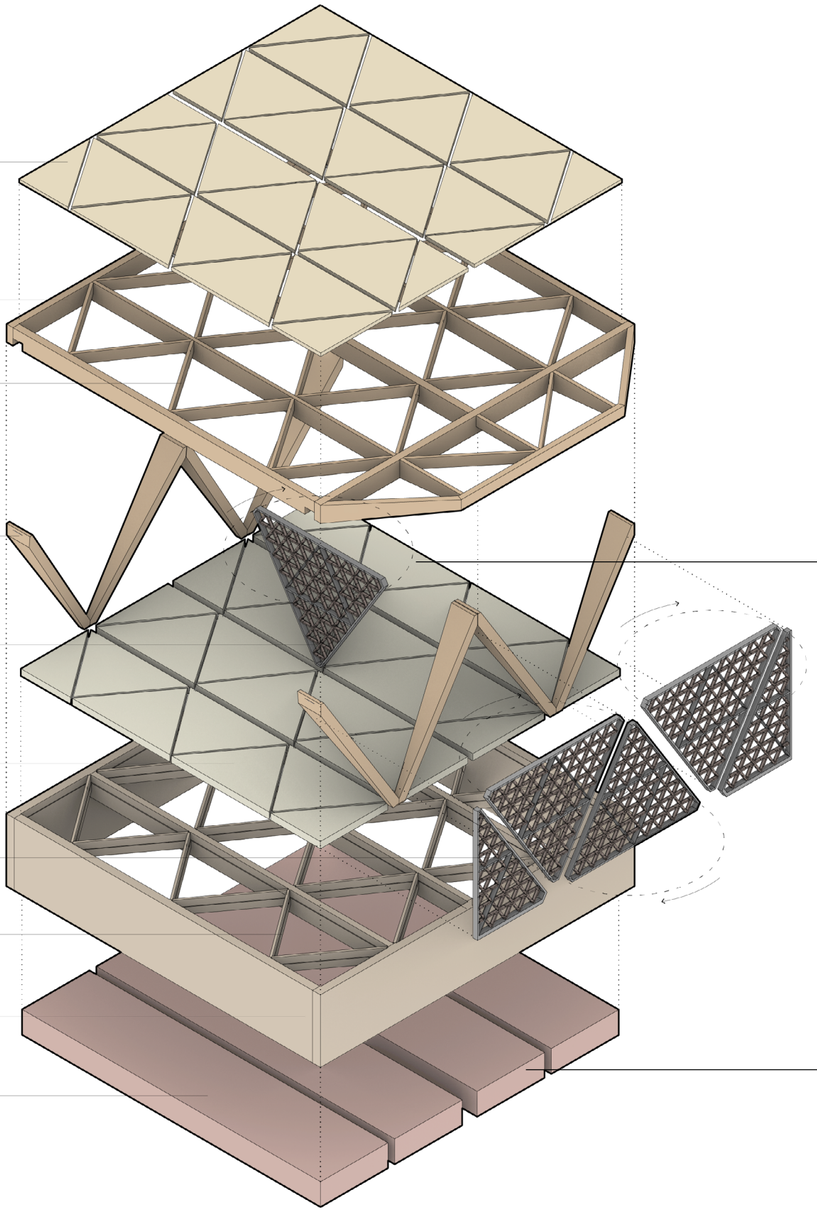
Tule Reed Compressed Panels
2.40m X 2.30m X 0.30m

Facade Adobe Lattice Skin with Metal Frame Structure
Structure width: 15cm

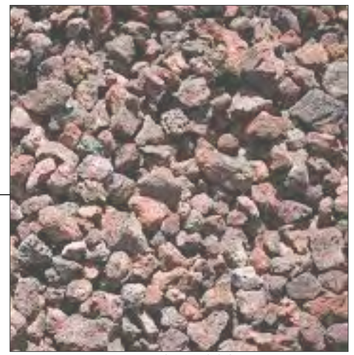
Beam Timber Secondary Foundation
0.60m X 0.20m

Beam Timber Framework Foundation
2.00m X 0.25m

Tezontle Stone Pebbles

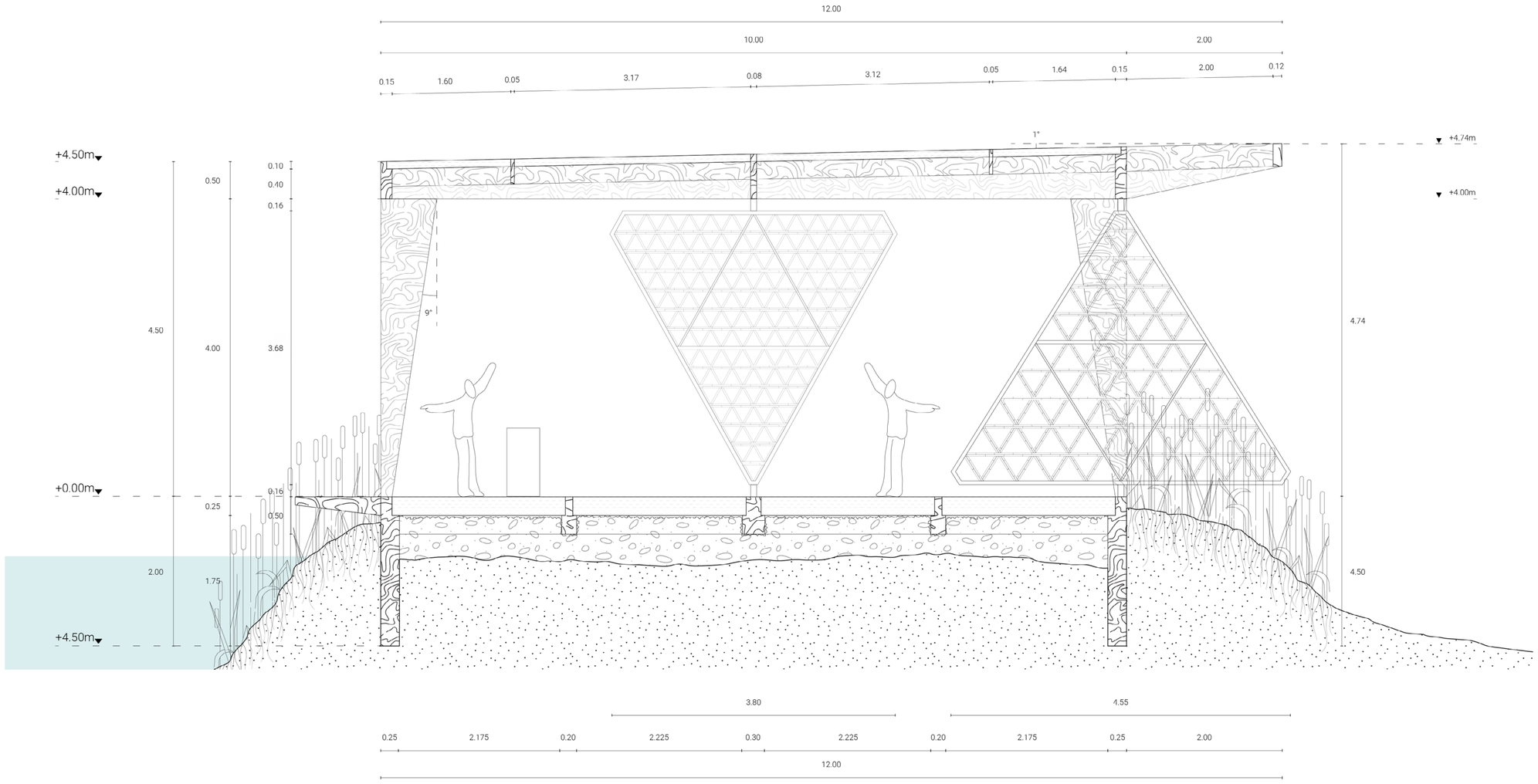


Tule Reed Compressed Panel

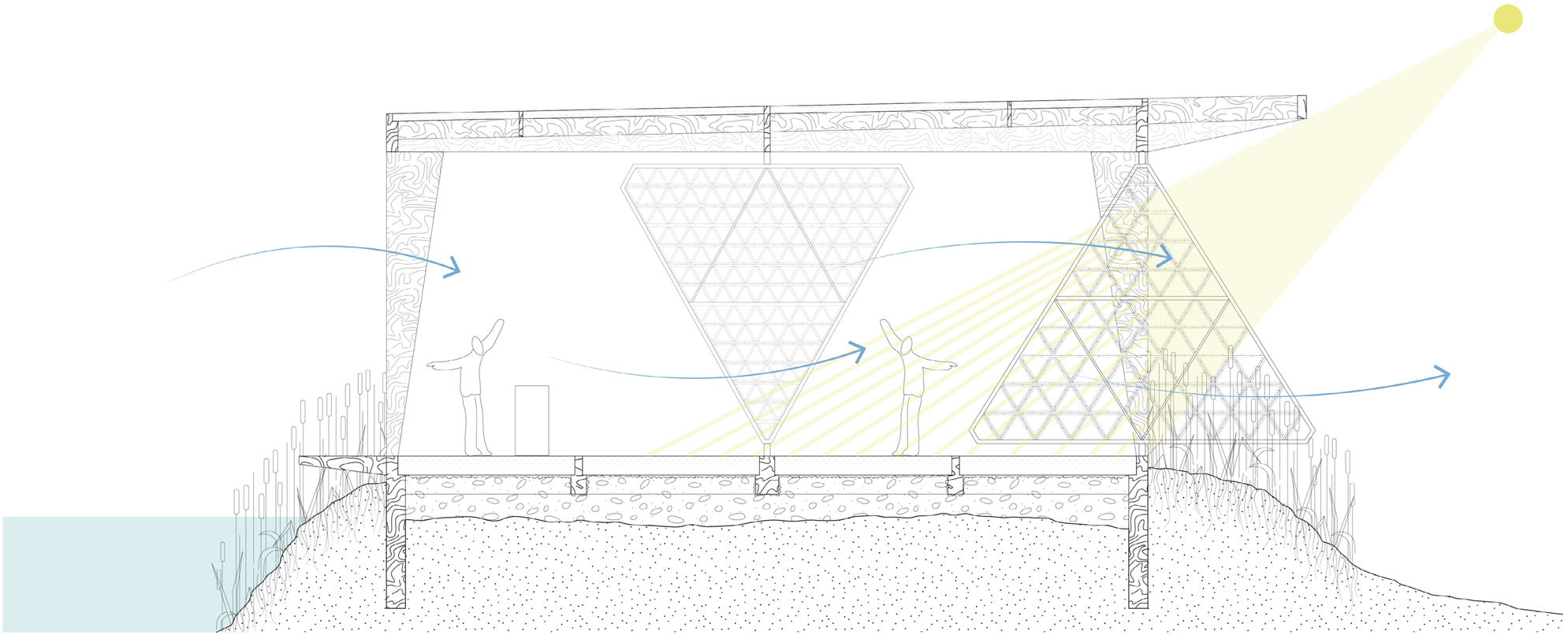


Tezontle Pebbles

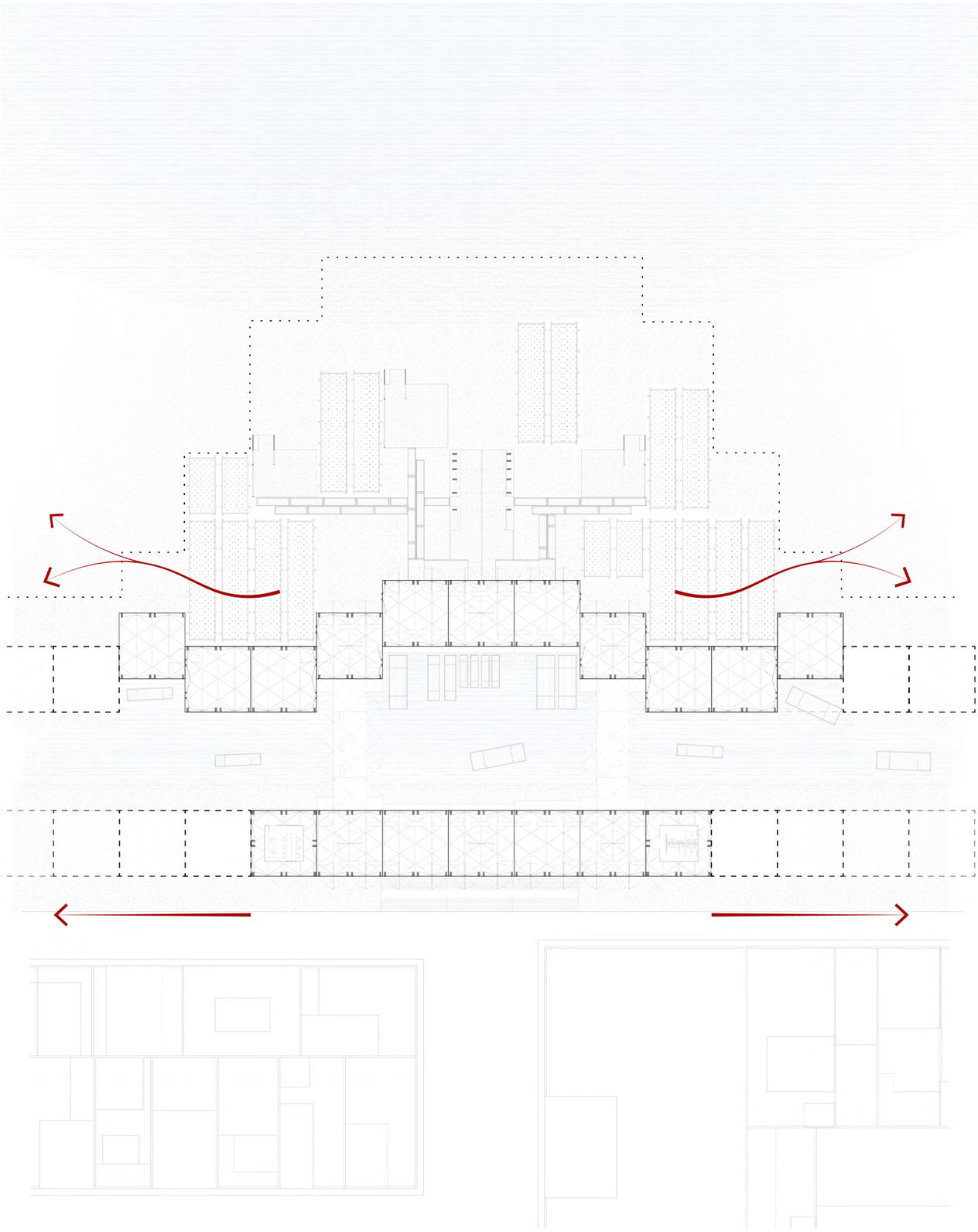
Tianguis Module - Section and Natural Flows

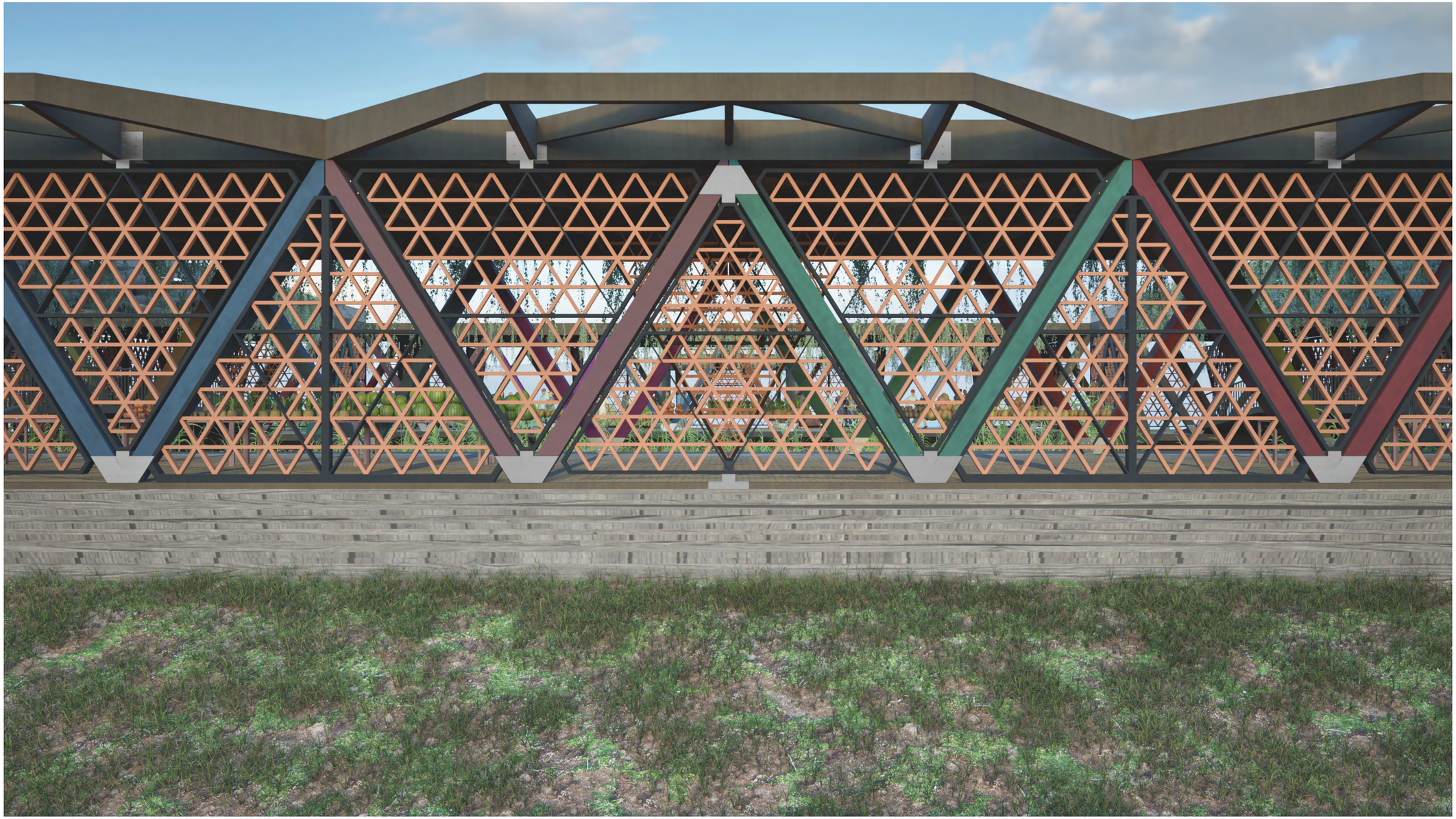


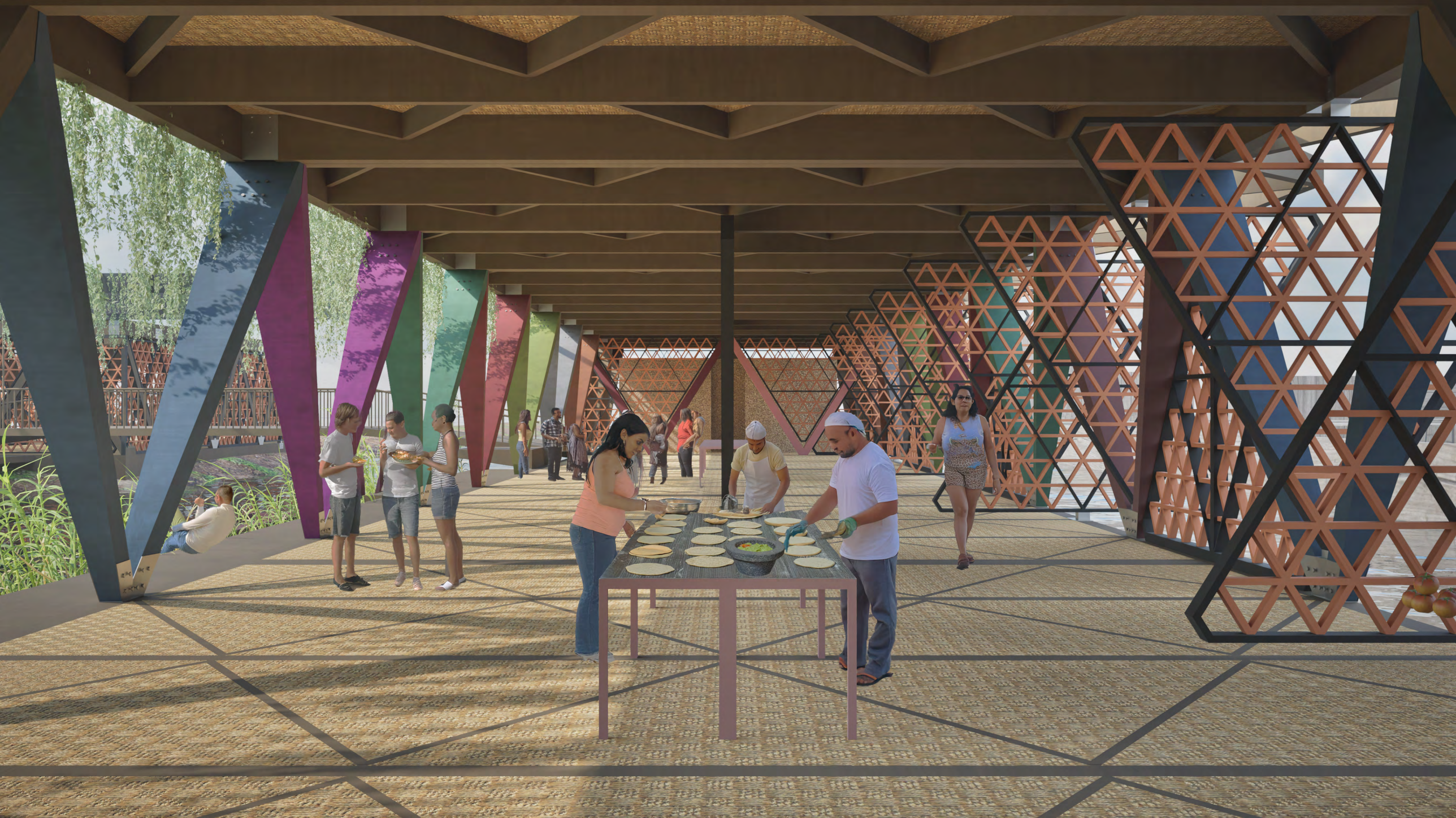
Tianguis Module - Section and Natural Phenomena

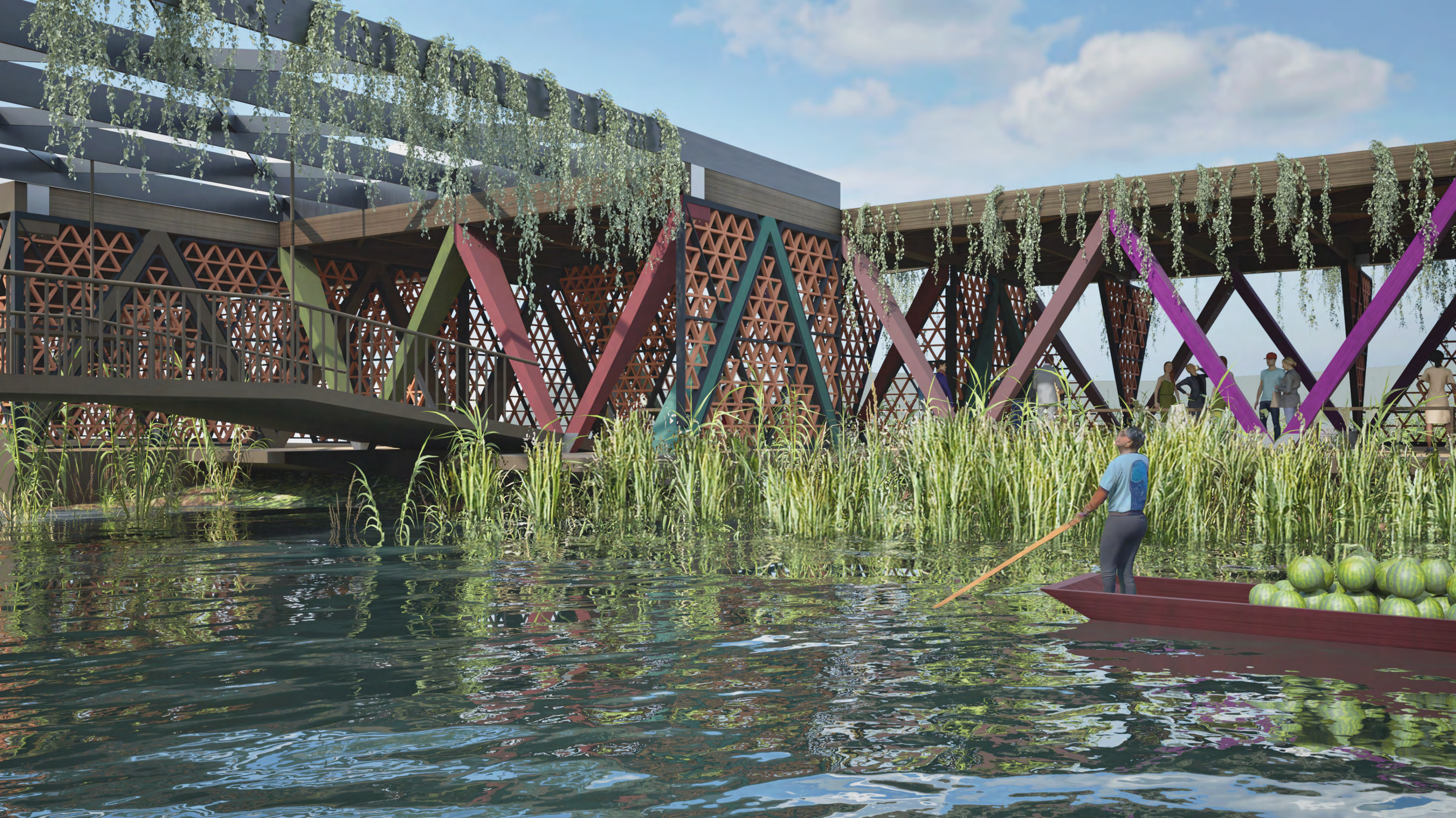


Wind Flow
Sunlight

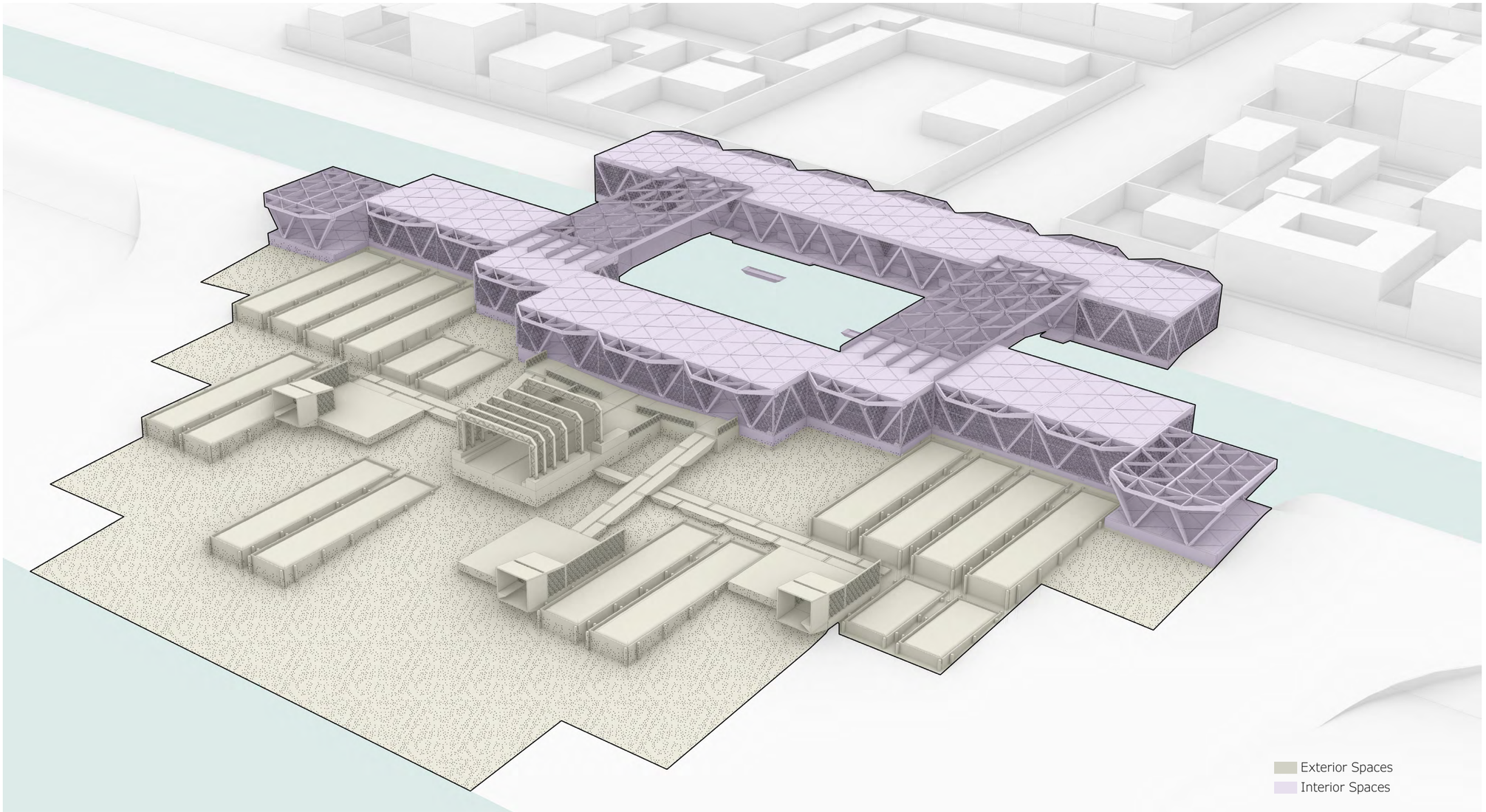




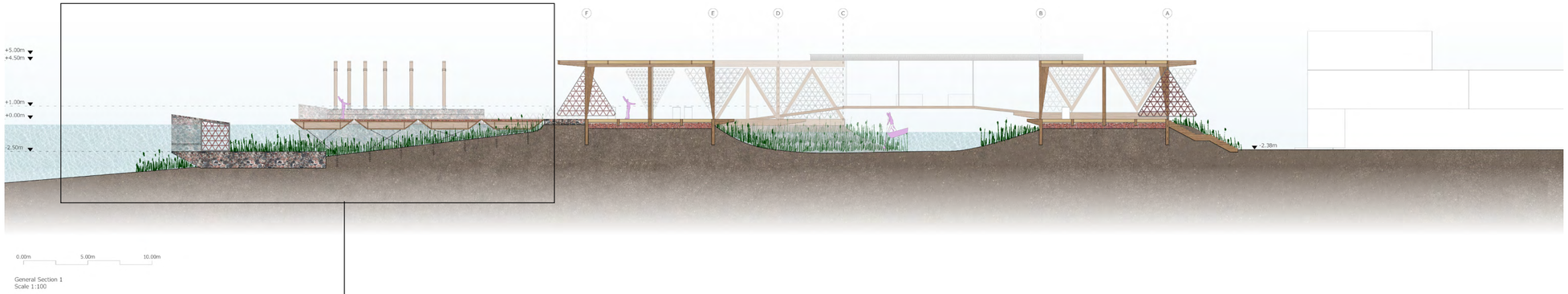


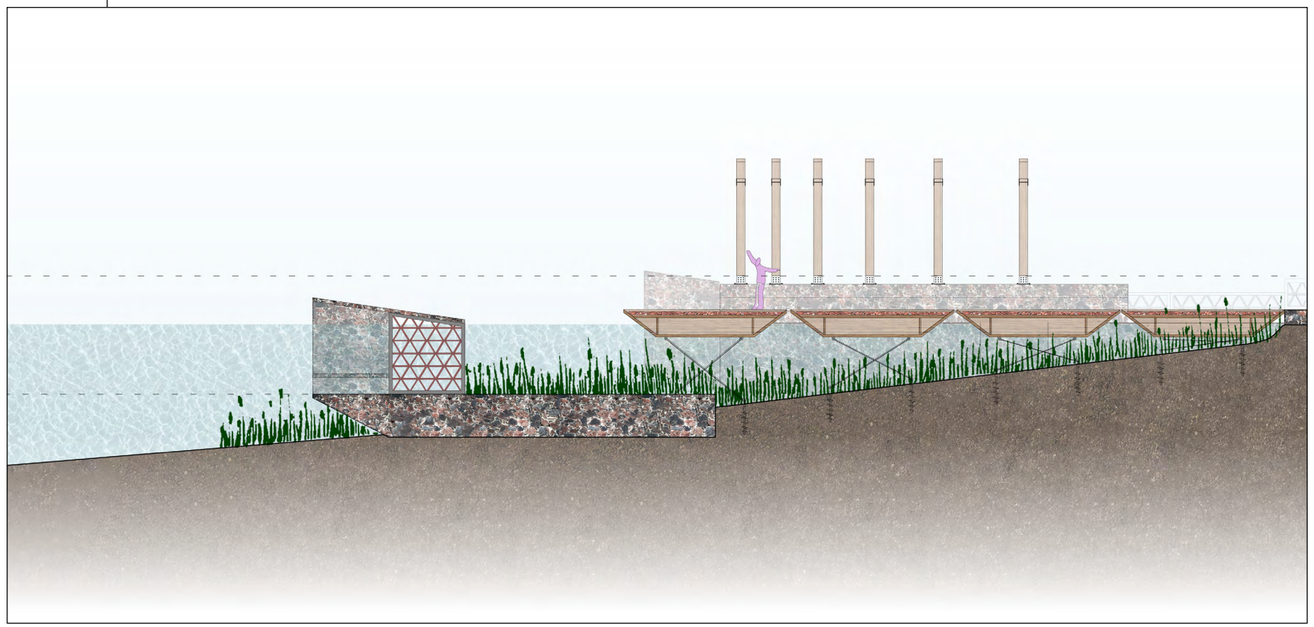


Project General Axonometry - Divisions

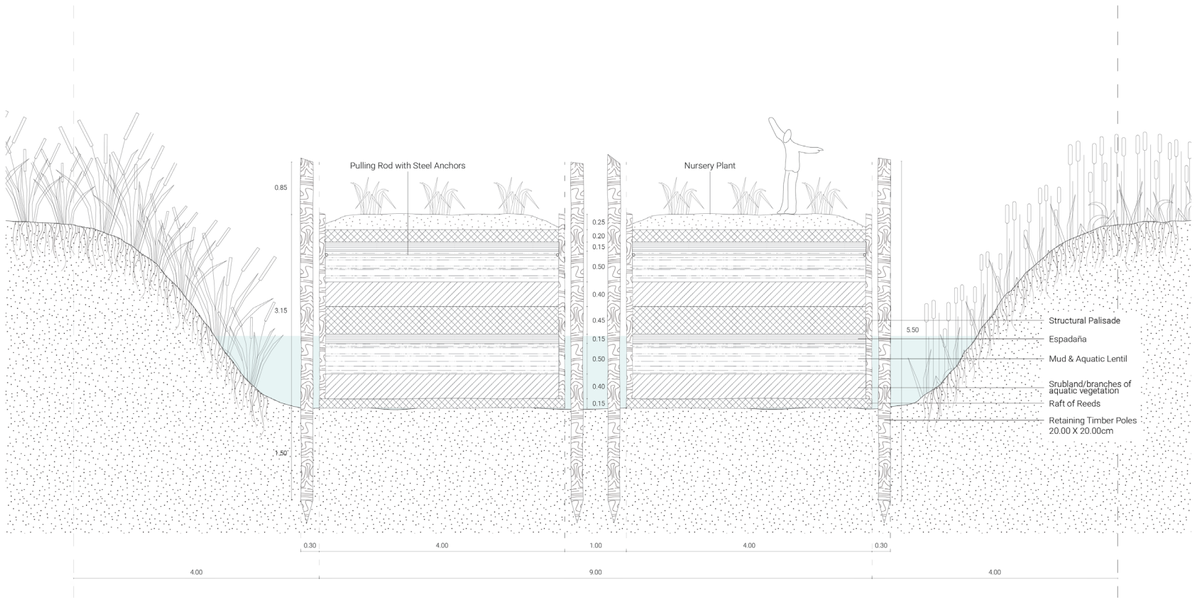


General Section 1

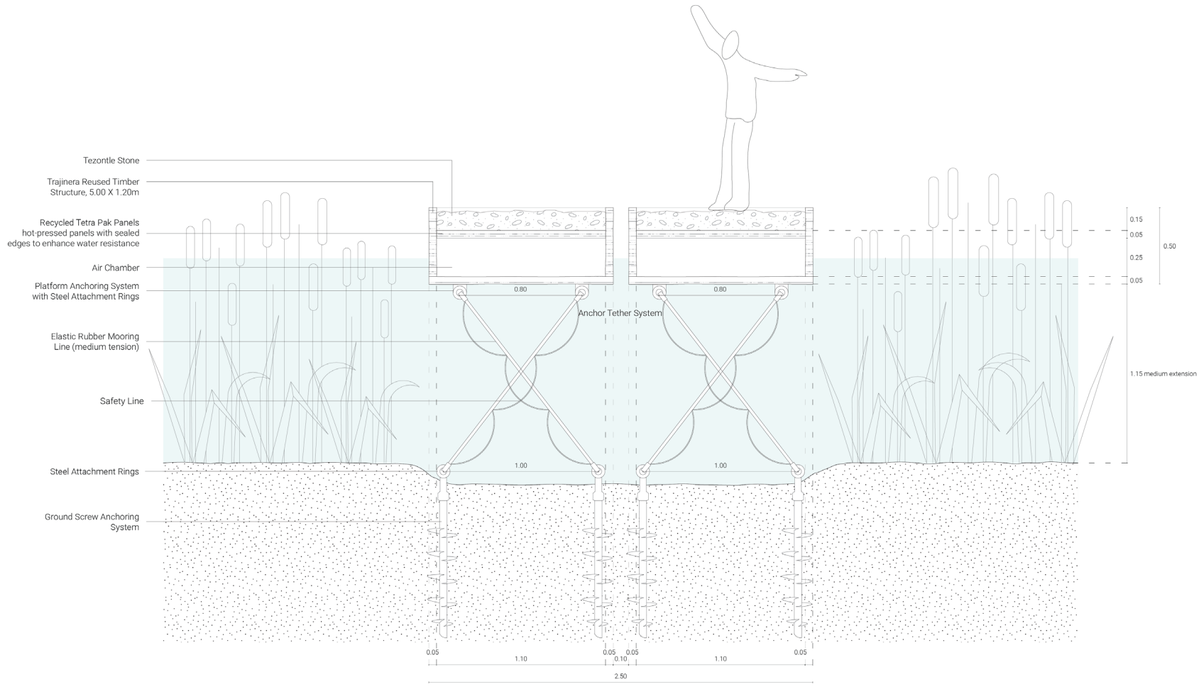




Chinampa and Trajinera Walking Path

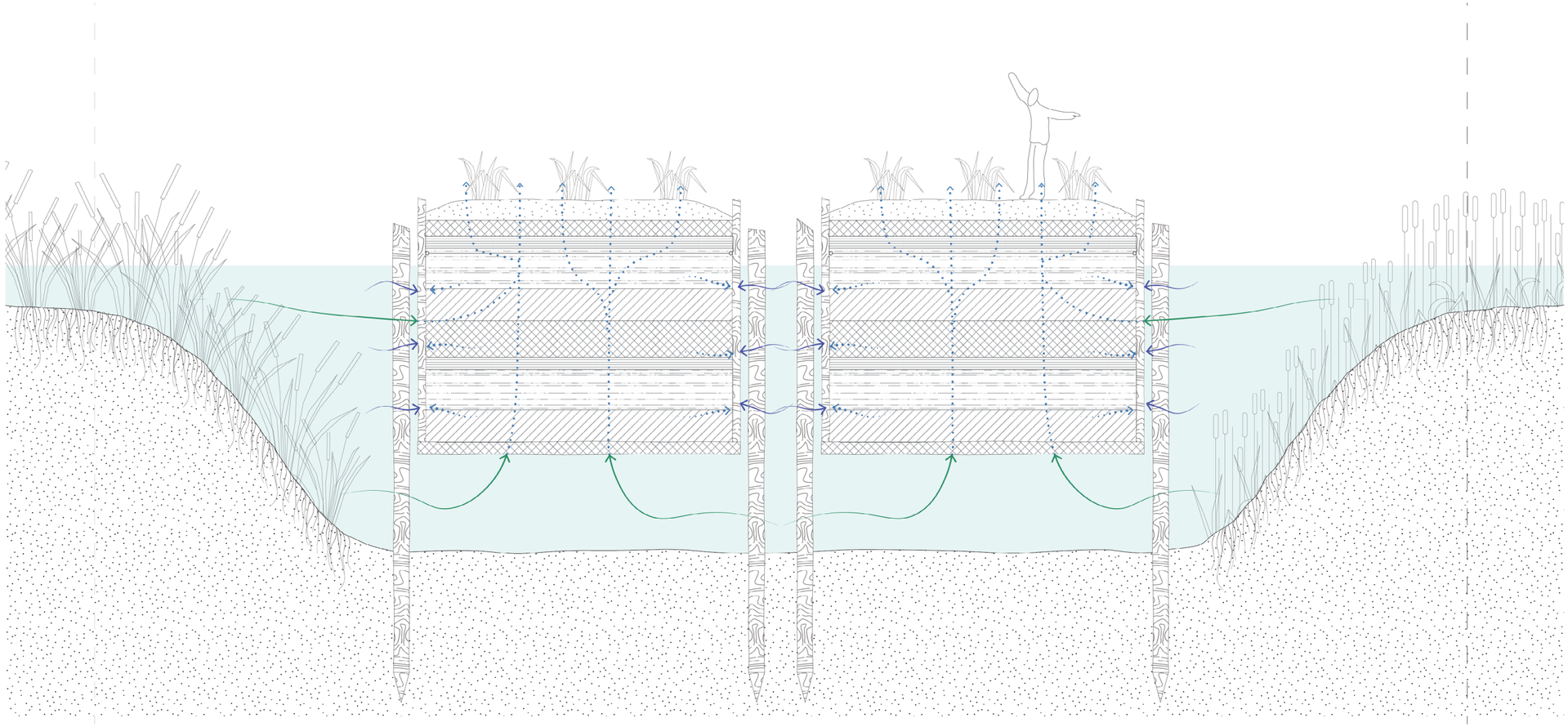


Chinampa Section



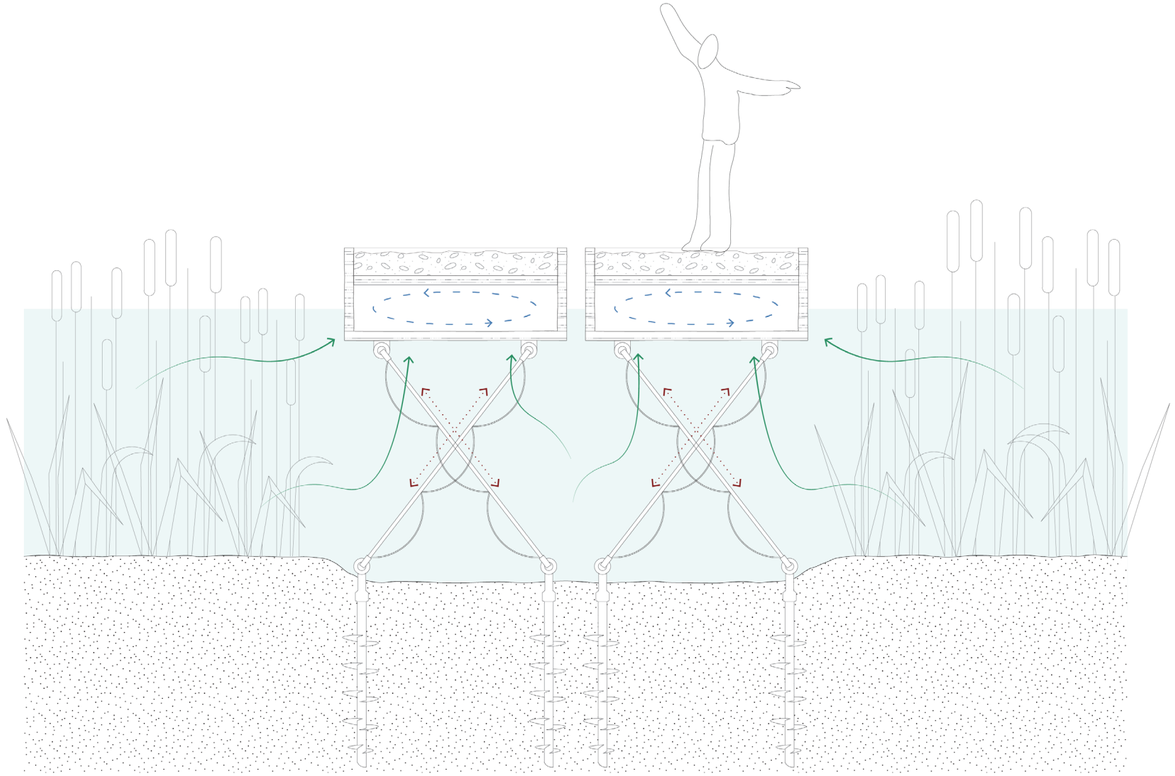
Trajinera Walking Path Section

Chinampa - Floatability Logic

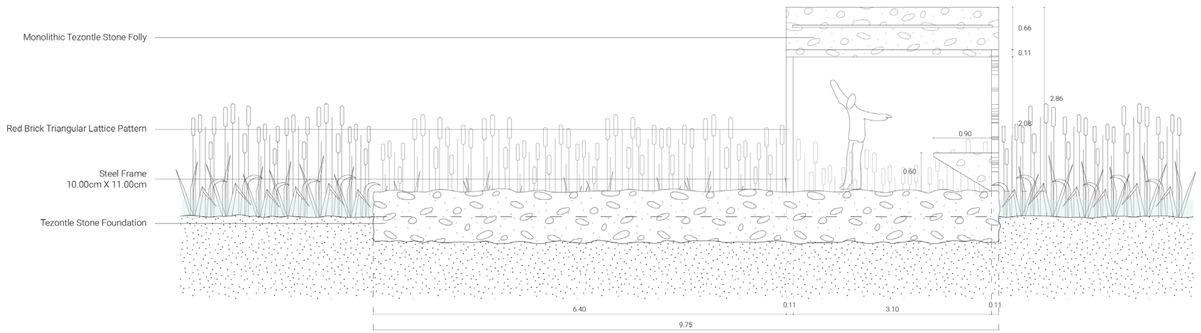


Humidity - Clean Water
External Water Forces
Internal Water Forces
Lake Water

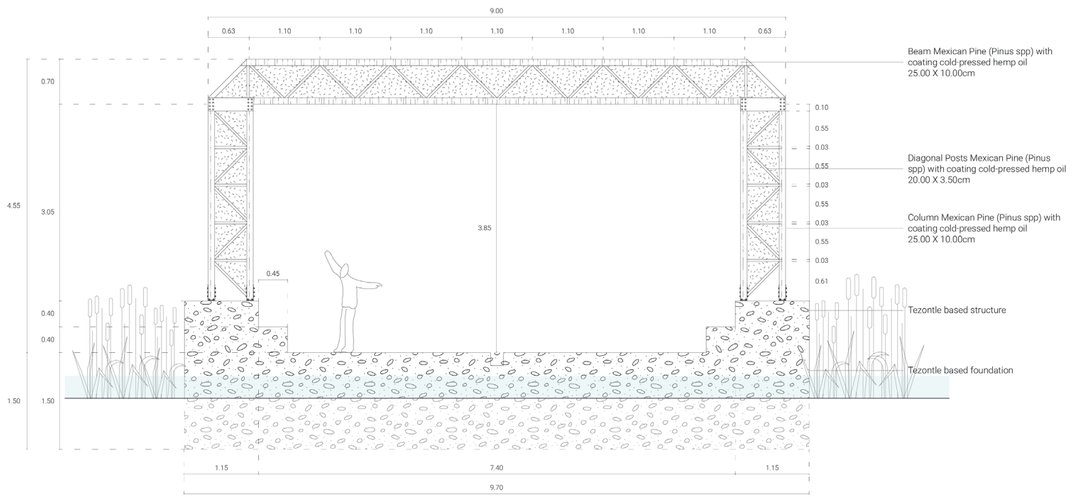
Trajinera Walking Path - Floatability Logic



Folly and Event Plaza

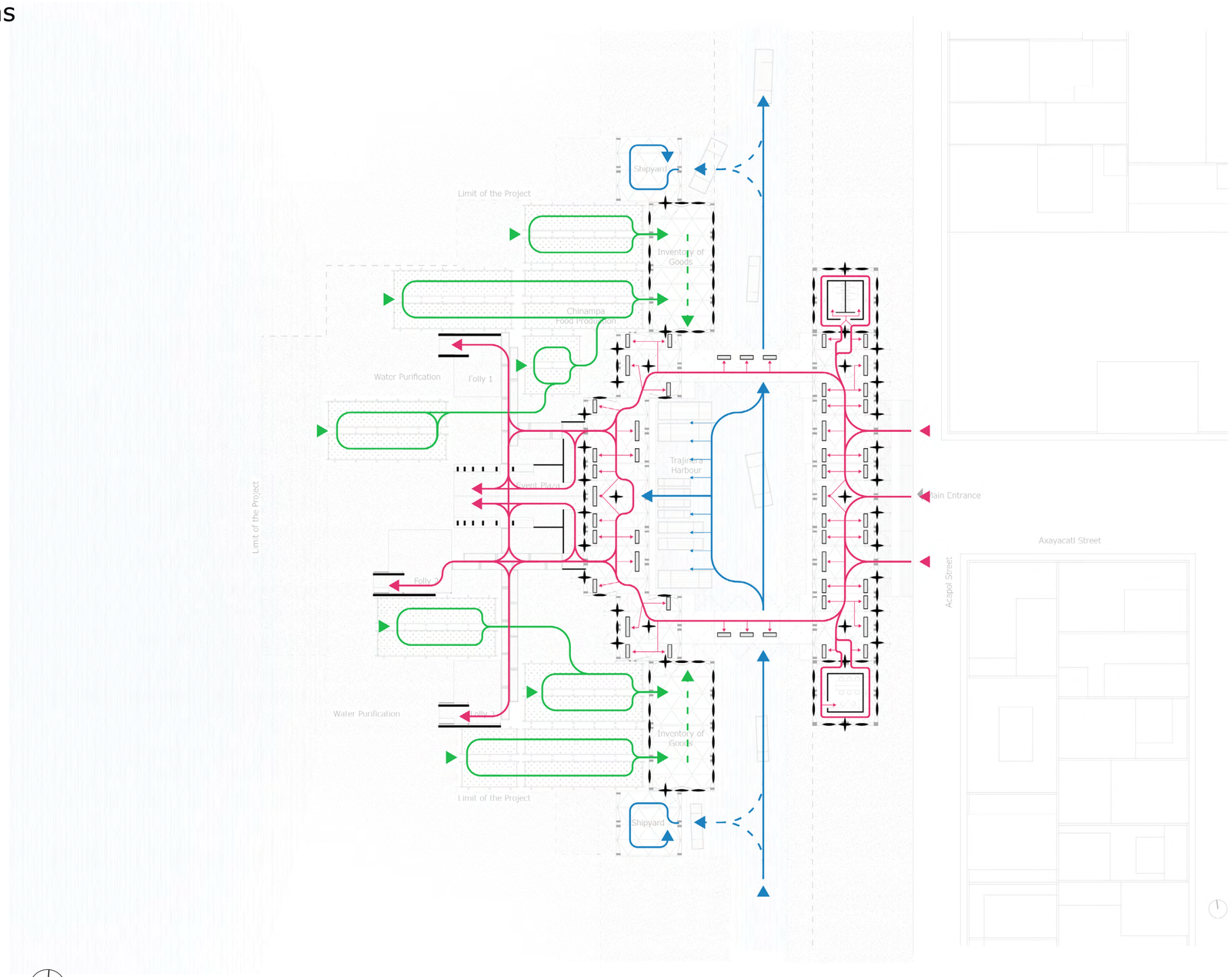


Folly Section



Event Plaza Section

Main Circulations



0Km 20.0m 40.0m 60.0m

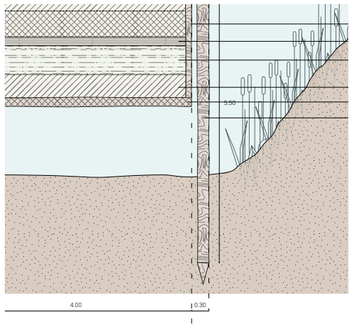
Visitor Circulation
Trajinero Circulation
Chinampero Circulation

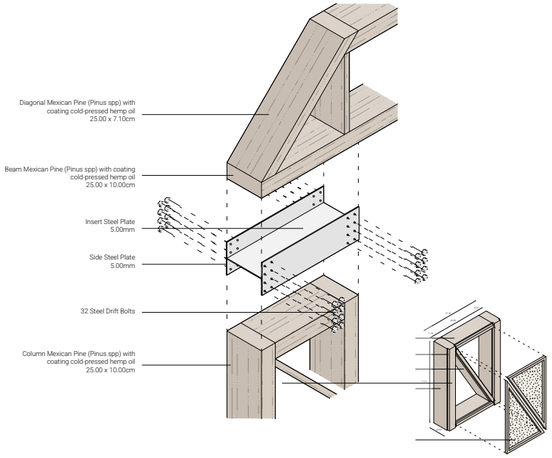
Material and Structural Principles

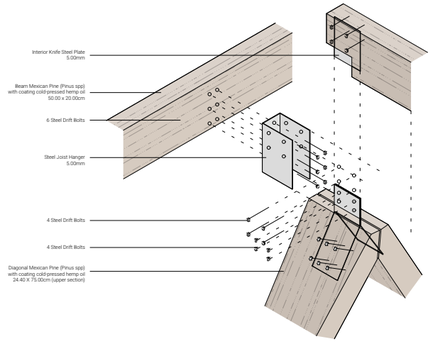
"Jardín Anatole" - Mexico City
Dellekamp+Schleich Arquitectos

Tezontle Wall

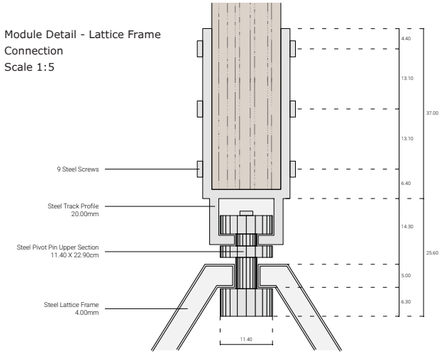
General Section 1

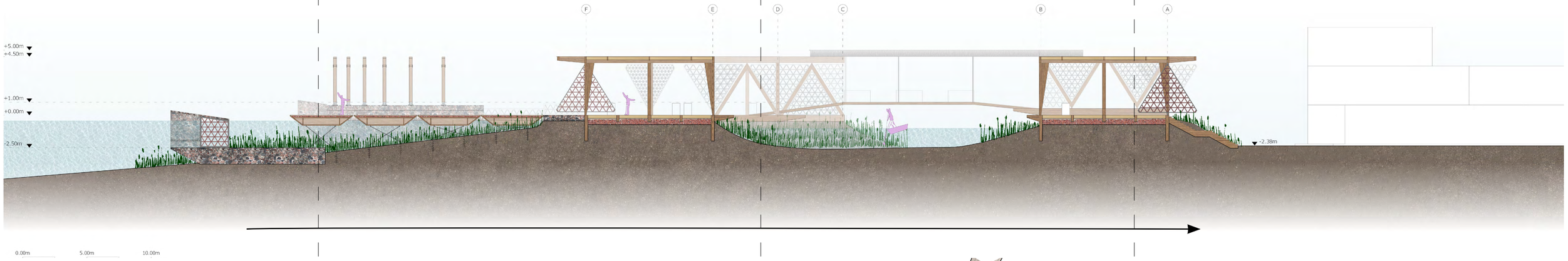


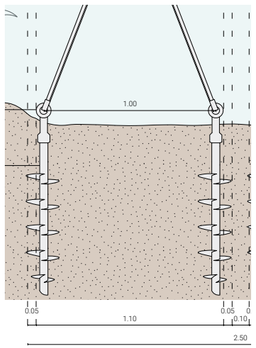


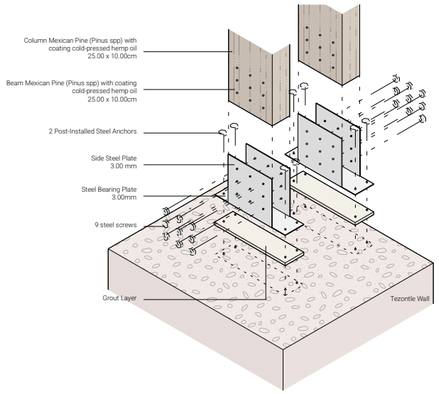


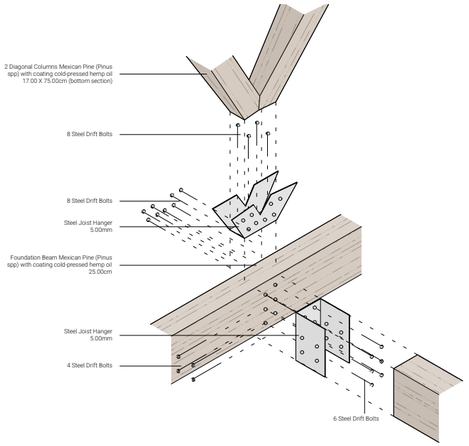
Module Detail - Lattice Frame Connection
Scale 1:5

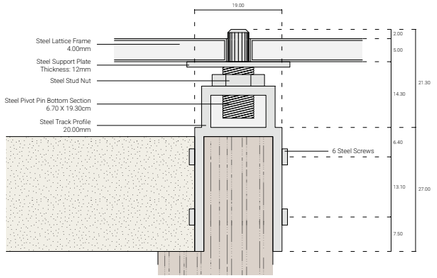




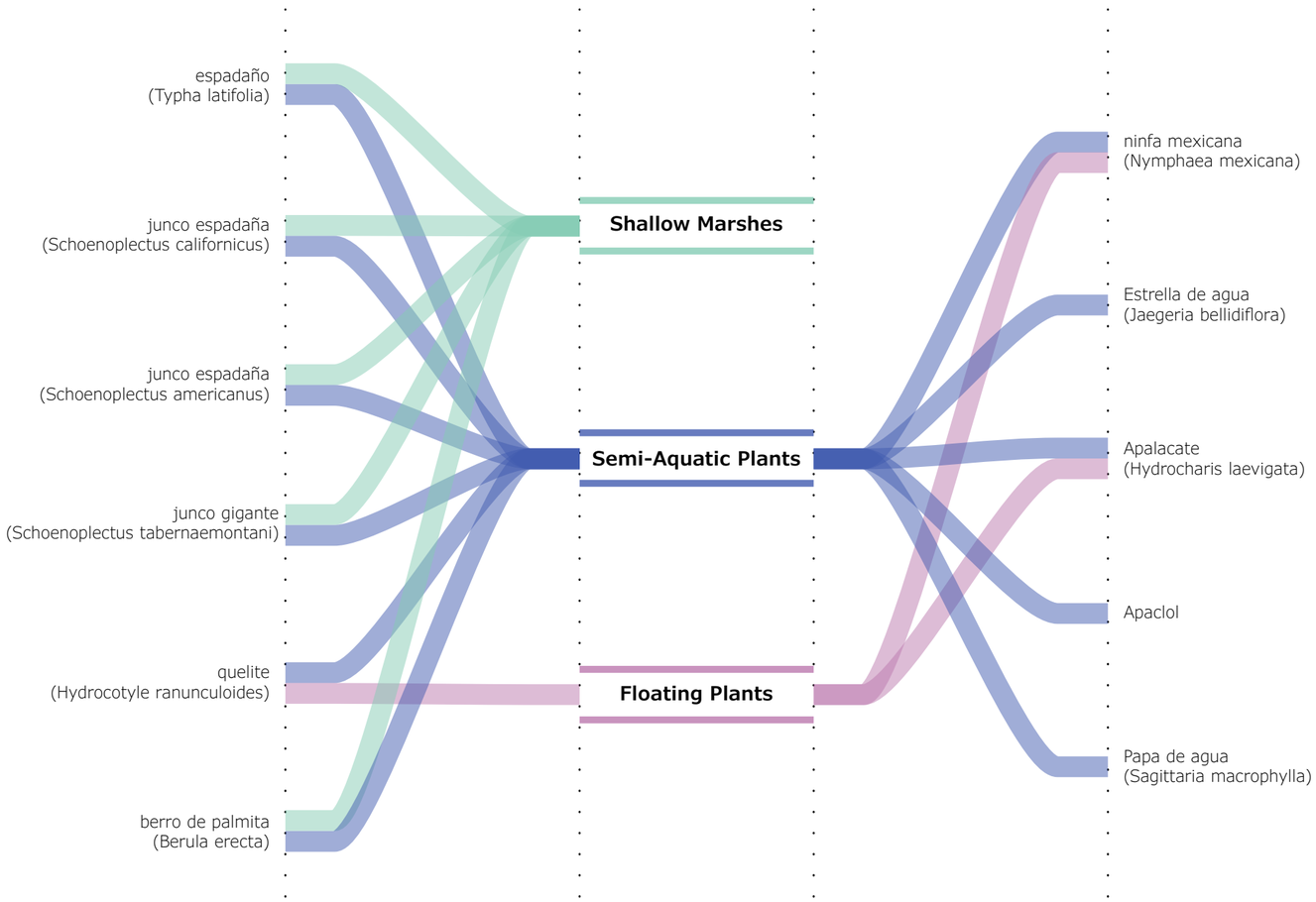




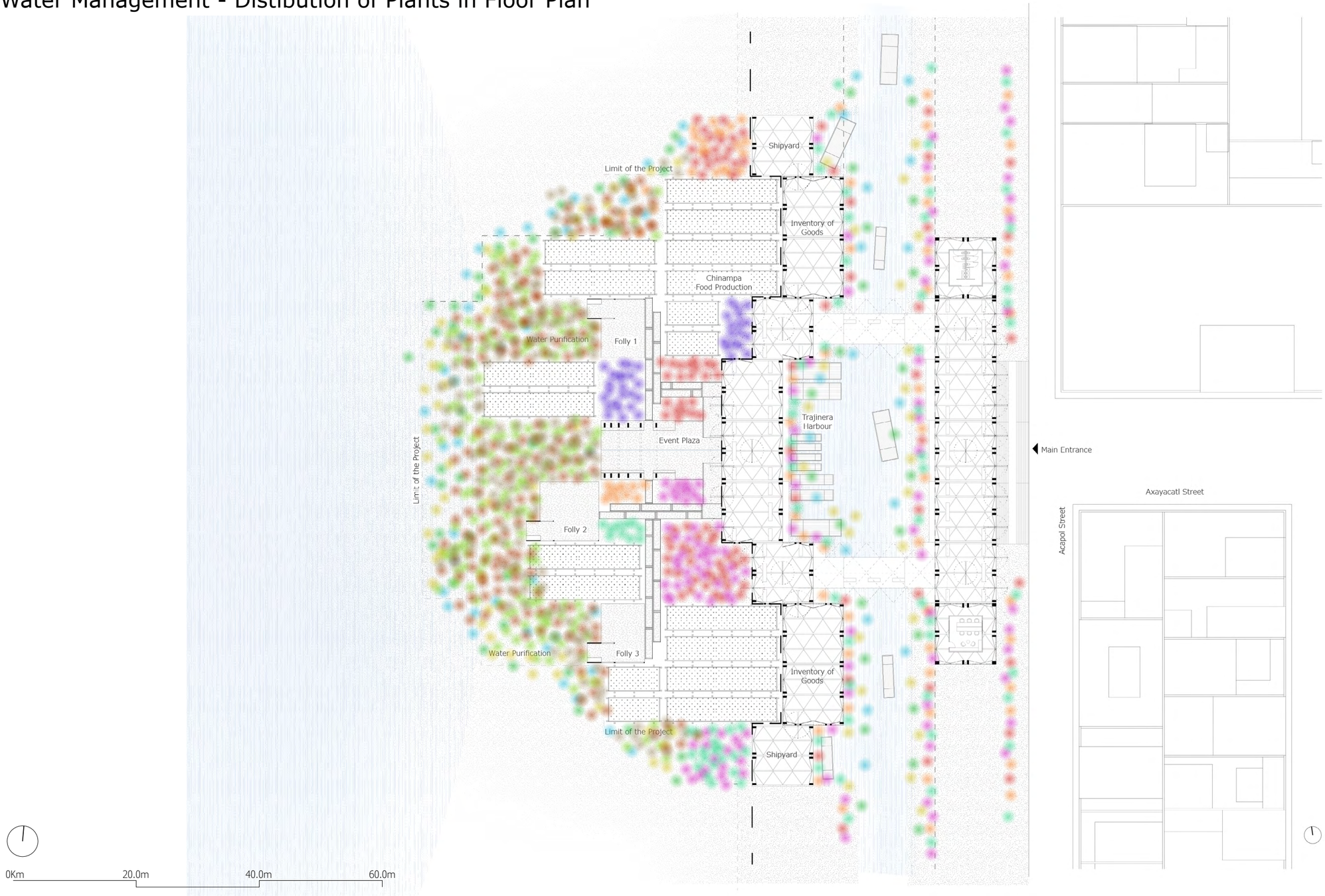




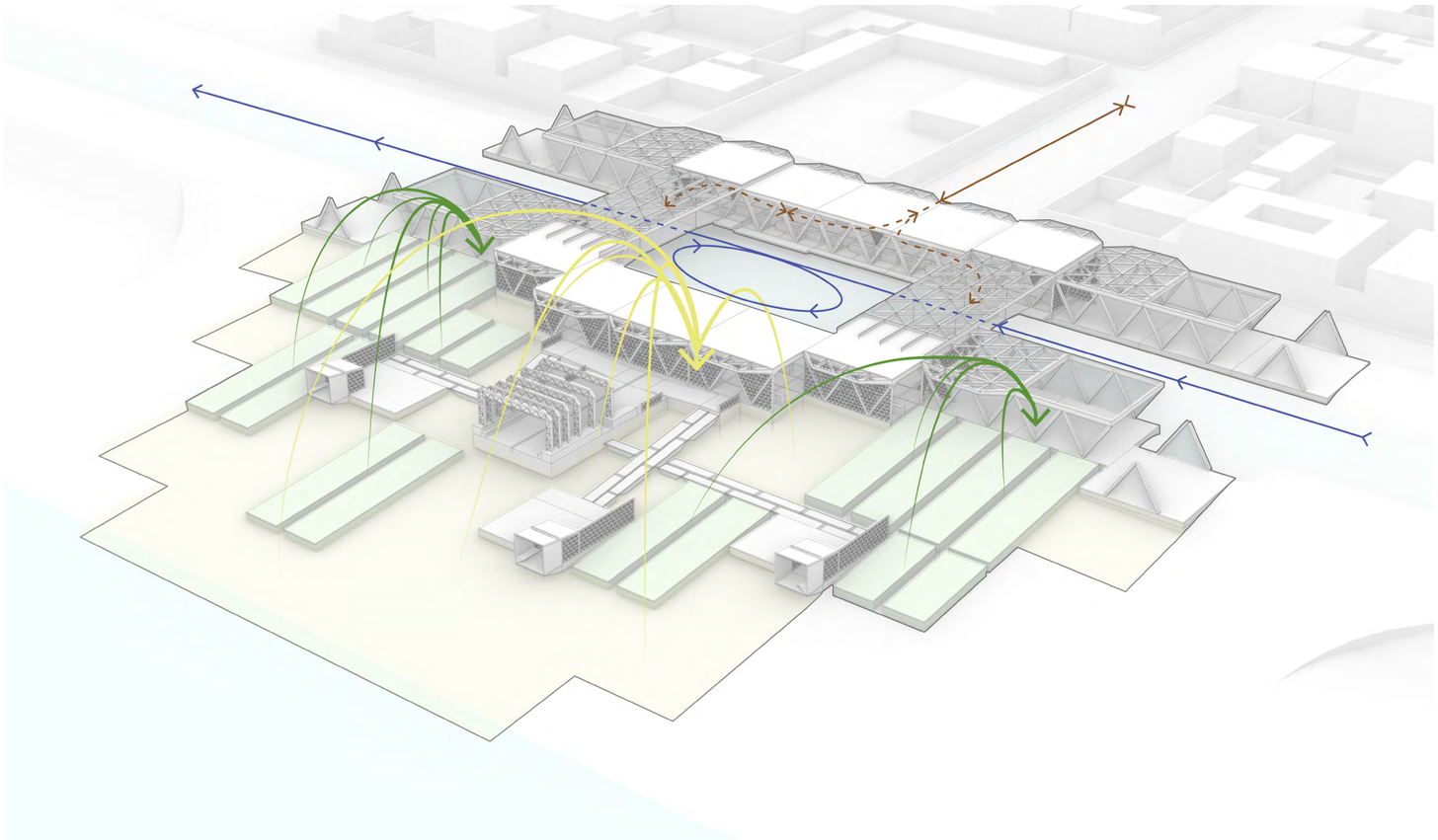
Water Management - Catalogue of Plants



Water Management - Distibution of Plants in Floor Plan

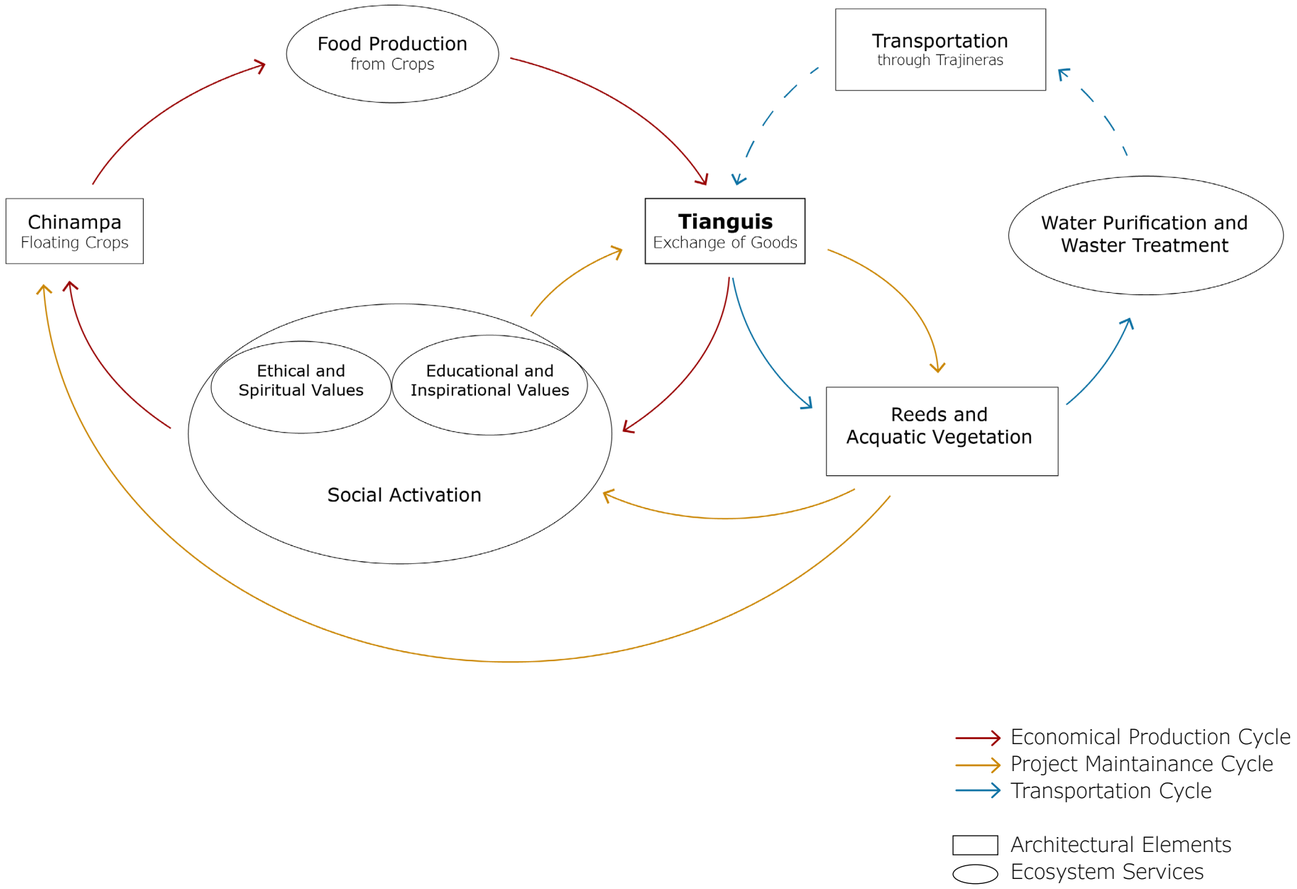


Sustaniability and Circularity



Reed Movement
Chinampa Movement
Trajinera Movement
Visitor's Movement

Sustaniability and Circularity



Interior	
Area Module	100m2
Area Total Tianguis	2000m2
Area Services	200m2
Area Storage	400m2
Area Shipyard	200m2
Area Efective Tianguis	1200m2
Commerce Spots	50 spots
Average Space per Spots	20m2
Peak occupancy (# visitors)	4.8m2/person
% of population	2%

Expected 250 visitors

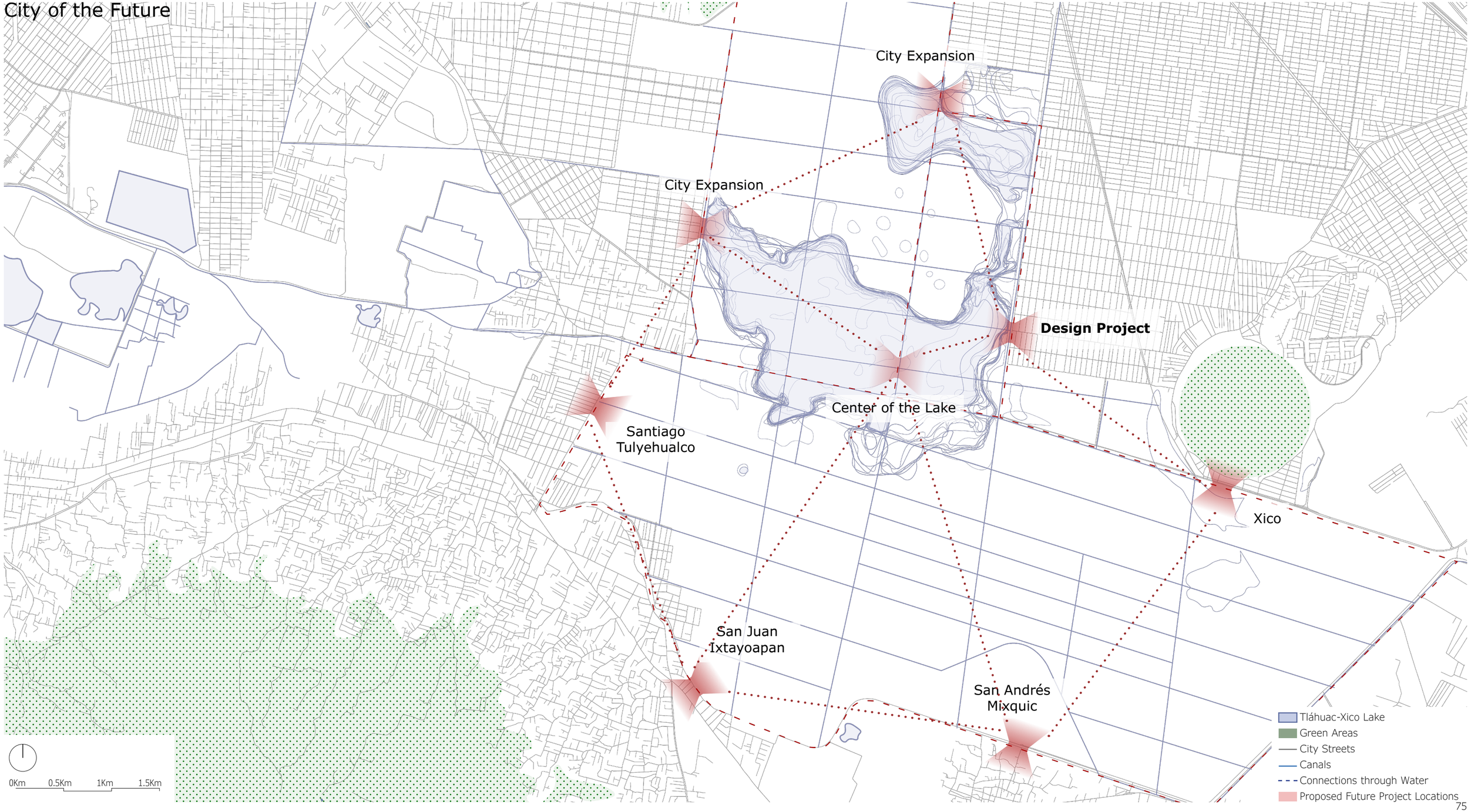
Exterior	
Event Plaza	161m2
Follies	225m2
Trajinera Pathway	162m2
Total	548m2
Trajinera per unit	6m2
Peak occupancy (# visitors)	4.5m2/person
% of population	1%

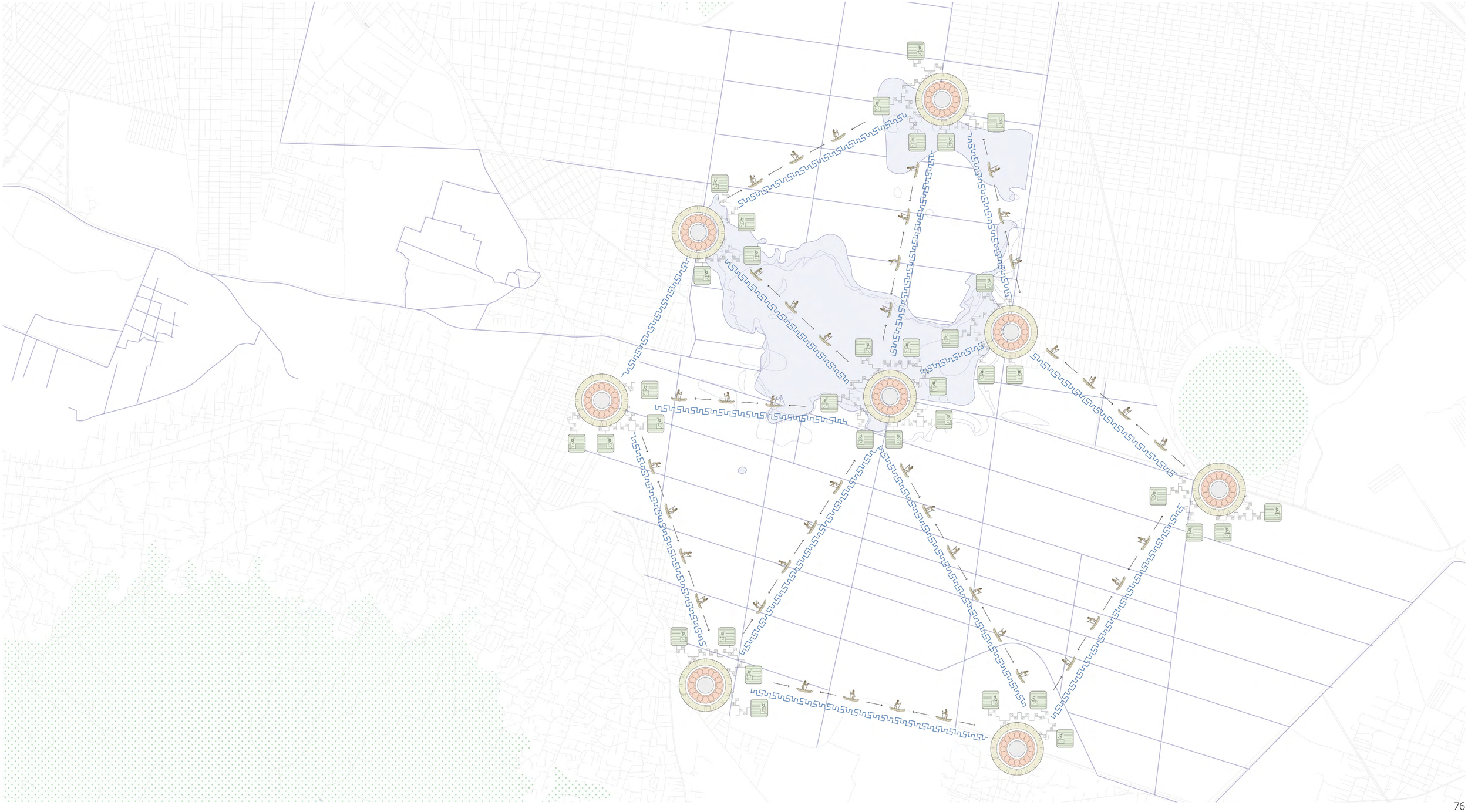
Expected 120 visitors

Production	
Average chinampa production	0.4kg/m2/season
# of chinampas	18 chinampas
Total productive area	1140m2
Total kg per season	~500kg or 0.5ton

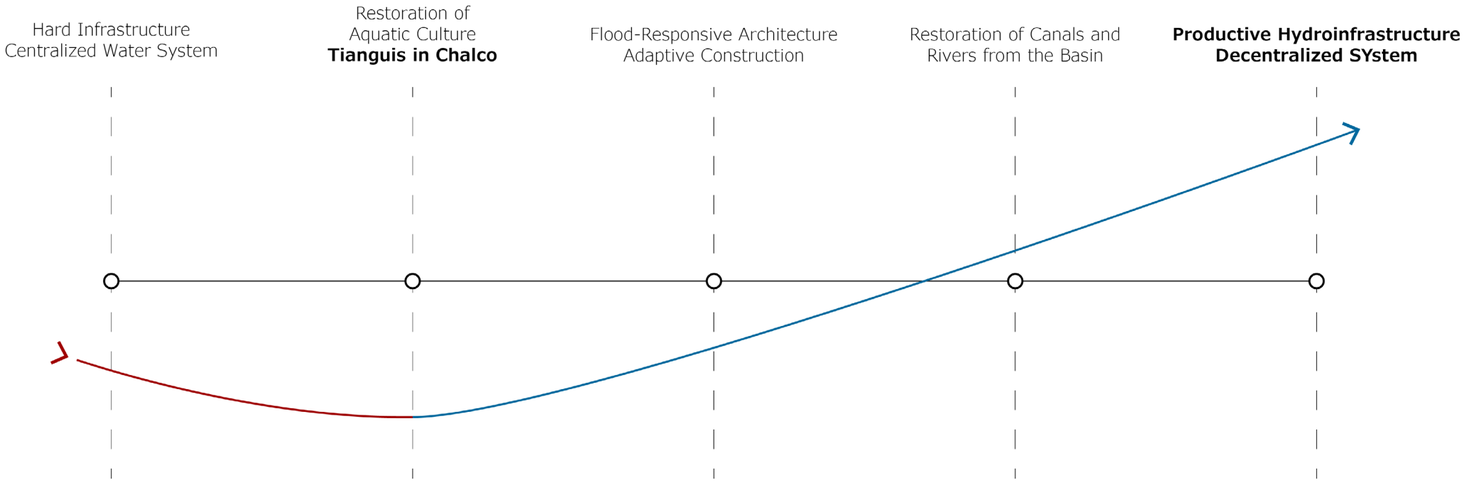
Total inhabitants San Miguel Xico	13,683
Total peak occupancy (# visitors)	370
% of population	3%

City of the Future





Reflection


Hard Infrastructure
Centralized Water System
Restoration of
Aquatic Culture
Tianguis in Chalco
Flood-Responsive Architecture
Adaptive Construction
Restoration of Canals and
Rivers from the Basin
Productive Hydroinfrastructure
Decentralized SYstem